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THE  
AMERICAN EPHEMERIS

AND  
NAUTICAL ALMANAC

FOR THE YEAR

1907

*FIRST EDITION*

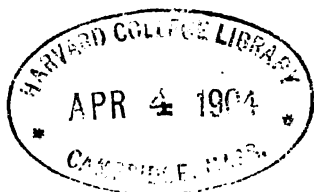
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WASHINGTON  
BUREAU OF EQUIPMENT  
1903

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## P R E F A C E.

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The general arrangement of the *American Ephemeris and Nautical Almanac*, with few slight changes, remains the same with the volume for the year 1900.

The Ephemeris is divided into four parts, as follows:

Part I, *Ephemeris for the Meridian of Greenwich*, which gives the ephemerides of the Sun and Moon, the geocentric and heliocentric positions of the major planets, the Sun's co-ordinates, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, which gives the ephemerides for the fixed stars, Sun, Moon, and major planets for transit over the meridian of the new Naval Observatory, Washington. The mean places of the fixed stars and the data for their reduction are also included in this part.

Part III, *Phenomena*, which contains predictions of phenomena to be observed, with data for their computation. Washington mean time for the meridian of the new Naval Observatory is used throughout this part except in a few cases, notably those of eclipses, where Greenwich mean time seems more convenient.

Part IV, *Star numbers, apparent places of stars, and other data based on the Constants of the Paris Conference of 1896*, which gives precession, obliquity, etc., Besselian star-numbers, independent star-numbers, ephemerides of five northern circumpolar stars, and ephemerides of twenty-five other stars whose apparent places differ from those given in Part II.

WALTER S. HARSHMAN,

*Professor of Mathematics, U. S. Navy,*

*Director Nautical Almanac.*

WASHINGTON, December, 1903.



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## CORRECTIONS.

### *Ephemeris, 1904. (In some copies of first edition only.)*

Page.			
vii, Dominical Letter	for C		read C B
203, Last line, Upper Transit	for $21^{\text{h}} 8^{\text{m}}.5$		read $21^{\text{h}} 8^{\text{m}}.0$
439, Limits	for $+8^{\circ} 40'.4$		read $+8^{\circ} 41'.0$
	$162^{\circ} 47'.8 \text{ E}$		$162^{\circ} 47'.7 \text{ E}$
	$+7^{\circ} 5'.4$		$+7^{\circ} 4'.9$
	$162^{\circ} 51'.4 \text{ E}$		$162^{\circ} 51'.5 \text{ E}$
	$-25^{\circ} 49'.3$		$-25^{\circ} 49'.7$
	$69^{\circ} 48'.7 \text{ W}$		$69^{\circ} 48'.9 \text{ W}$

583, Second line, after "Appendix I," insert—

"In the case of the elongations of Mimas and Tethys, however, corrections have been applied to make them conform with the elements of Prof. H. Struve, in *Beobachtungen der Saturnstrabanten*, St. Petersburg, 1898."

### *Ephemeris, 1905. (First edition only.)*

203, Last line, Upper Transit	for 26.0	read 25.5
	1.81	1.80

### *Ephemeris, 1906. (First edition only.)*

Preface, Part IV	for "four northern and one southern"	read "five northern."
484, $\theta$ , for December	for $151^{\circ}$	read $208^{\circ}$
	158	202
	160	199
	163	196
	166	193
	170	189
	174	185
560, First line	for 2nd	read 15th
567, Pages 312-323	for $\sigma$ Octantis	read 6 B Ursæ Minoris



# CHRONOLOGICAL ERAS AND CYCLES.

## CHRONOLOGICAL ERAS.

THE YEAR 1907, WHICH COMPRISES THE LATTER PART OF THE 131ST AND THE BEGINNING OF THE 132D YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6620 of the Julian Period;

- " 7415-7416 of the Byzantine era, the year 7416 commencing on September 1;
- " 5667-5668 of the Jewish era, the year 5668 commencing on September 9, or, more exactly, at sunset on September 8;
- " 2660 since the foundation of Rome, according to VARRO;
- " 2654 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period; corresponding, in the notation of chronologists, to the 747th, and, in the notation of astronomers, to the 746th year before the birth of CHRIST;
- " 2683 of the Olympiads, or the third year of the 671st Olympiad, commencing in July, 1907, if we fix the era of the Olympiads at  $775\frac{1}{2}$  years before CHRIST, or near the beginning of July of the year 3938 of the Julian Period;
- " 2219 of the Grecian era, or the era of the SELEUCIDÆ, which began near the vernal equinox of the year, — 311 = B. C. 312, = 4402 of the Julian Period;
- " 1623 of the era of DIOCLETIAN;
- " 2567 of the Japanese era and to the 40th year of the period entitled "Meiji."

The year 1325 of the Mohammedan era, or the era of the Hegira, begins on the 14th day of February, 1907.

The first day of January of the year 1907 is the 2,417,577th day since the commencement of the Julian Period.

## CHRONOLOGICAL CYCLES.

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Epact . . . . .	16	Roman Indiction . . . . .	5
Lunar Cycle or Golden Number . . . . .	8	Julian Period . . . . .	6620

# SYMBOLS AND ABBREVIATIONS.

## SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
♁	The Earth.	♆	Neptune.

## SIGNS OF THE ZODIAC.

Spring Signs.	{	1.	♈	Aries.	Autumn Signs.	{	7.	♎	Libra.
		2.	♉	Taurus.			8.	♏	Scorpius.
		3.	♊	Gemini.			9.	♐	Sagittarius.
Summer Signs.	{	4.	♋	Cancer.	Winter Signs.	{	10.	♑	Capricornus.
		5.	♌	Leo.			11.	♒	Aquarius.
		6.	♍	Virgo.			12.	♓	Pisces.

## ASPECTS.

- ♌ Conjunction, or having the same Longitude or Right Ascension.
- ☐ Quadrature, or differing  $\pm 90^\circ$  in Longitude or Right Ascension.
- ♌ Opposition, or differing  $180^\circ$  in Longitude or Right Ascension.

## ABBREVIATIONS.

♊	Ascending Node.	°	Degrees.
♋	Descending Node.	'	Minutes of Arc.
N.	North.	"	Seconds of Arc.
S.	South.	h	Hours.
E.	East.	m	Minutes of Time.
W.	West.	s	Seconds of Time.

PART I

---

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH.

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.				
		h m s	s	° ' "	"	' "	s	m s	s	
Tues.	1	18 43 15.76	11.050	S. 23 4 37.7	+ 11.41	16 17.88	71.08	3 18.19	1.190	
Wed.	2	18 47 40.80	11.037	22 59 49.7	12.56	16 17.89	71.04	3 46.59	1.177	
Thur.	3	18 52 5.51	11.023	22 54 34.2	13.71	16 17.89	71.00	4 14.67	1.163	
Frid.	4	18 56 29.88	11.007	22 48 51.4	+ 14.85	16 17.89	70.95	4 42.41	1.148	
Sat.	5	19 0 53.87	10.991	22 42 41.3	15.98	16 17.87	70.89	5 9.76	1.132	
SUN.	6	19 5 17.47	10.973	22 36 4.2	17.10	16 17.85	70.83	5 36.73	1.115	
Mon.	7	19 9 40.64	10.955	22 29 0.3	+ 18.22	16 17.82	70.76	6 3.26	1.096	
Tues.	8	19 14 3.35	10.936	22 21 29.8	19.32	16 17.79	70.69	6 29.35	1.077	
Wed.	9	19 18 25.58	10.916	22 13 32.7	20.42	16 17.75	70.62	6 54.95	1.056	
Thur.	10	19 22 47.31	10.894	22 5 9.7	+ 21.51	16 17.71	70.55	7 20.06	1.035	
Frid.	11	19 27 8.49	10.871	21 56 20.5	22.59	16 17.67	70.48	7 44.63	1.012	
Sat.	12	19 31 29.12	10.847	21 47 5.7	23.66	16 17.62	70.40	8 8.64	0.988	
SUN.	13	19 35 49.17	10.822	21 37 25.5	+ 24.71	16 17.57	70.32	8 32.06	0.963	
Mon.	14	19 40 8.59	10.796	21 27 20.2	25.74	16 17.51	70.23	8 54.86	0.937	
Tues.	15	19 44 27.37	10.769	21 16 49.8	26.77	16 17.45	70.14	9 17.02	0.910	
Wed.	16	19 48 45.49	10.741	21 5 55.1	+ 27.78	16 17.38	70.05	9 38.51	0.881	
Thur.	17	19 53 2.90	10.712	20 54 36.1	28.78	16 17.31	69.96	9 59.32	0.852	
Frid.	18	19 57 19.61	10.682	20 42 53.2	29.76	16 17.24	69.86	10 19.41	0.822	
Sat.	19	20 1 35.59	10.651	20 30 46.8	+ 30.74	16 17.17	69.76	10 38.77	0.791	
SUN.	20	20 5 50.81	10.619	20 18 17.2	31.70	16 17.09	69.66	10 57.39	0.759	
Mon.	21	20 10 5.26	10.586	20 5 24.6	32.65	16 17.01	69.56	11 15.23	0.727	
Tues.	22	20 14 18.94	10.554	19 52 9.6	+ 33.58	16 16.92	69.45	11 32.30	0.695	
Wed.	23	20 18 31.82	10.521	19 38 32.4	34.50	16 16.83	69.35	11 48.60	0.662	
Thur.	24	20 22 43.92	10.487	19 24 33.4	35.39	16 16.73	69.24	12 4.09	0.629	
Frid.	25	20 26 55.21	10.453	19 10 12.7	+ 36.28	16 16.63	69.13	12 18.78	0.596	
Sat.	26	20 31 5.69	10.419	18 55 31.2	37.15	16 16.52	69.02	12 32.67	0.562	
SUN.	27	20 35 15.36	10.385	18 40 29.0	38.01	16 16.40	68.91	12 45.75	0.528	
Mon.	28	20 39 24.22	10.351	18 25 6.4	+ 38.85	16 16.28	68.80	12 58.02	0.494	
Tues.	29	20 43 32.25	10.318	18 9 24.0	39.67	16 16.15	68.69	13 9.46	0.460	
Wed.	30	20 47 39.46	10.283	17 53 22.0	40.48	16 16.01	68.57	13 20.08	0.426	
Thur.	31	20 51 45.86	10.250	17 37 0.8	41.26	16 15.87	68.45	13 29.90	0.392	
Frid.	32	20 55 51.45	10.215	S. 17 20 20.9	+ 42.04	16 15.72	68.33	13 38.91	0.358	

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 05.19 from the sidereal time.  
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
Tues.	1	<sup>h</sup> 18 <sup>m</sup> 43 <sup>s</sup> 15.15	11.046	S. 23 4 38.3	+ 11.41	<sup>m</sup> 3 <sup>s</sup> 18.12	1.190	<sup>h</sup> 18 <sup>m</sup> 39 <sup>s</sup> 57.03
Wed.	2	18 47 40.10	11.033	22 59 50.5	12.57	3 46.51	1.177	18 43 53.59
Thur.	3	18 52 4.73	11.019	22 54 35.2	13.71	4 14.58	1.163	18 47 50.15
Frid.	4	18 56 29.01	11.004	22 48 52.6	+ 14.84	4 42.31	1.148	18 51 46.70
Sat.	5	19 0 52.92	10.988	22 42 42.7	15.97	5 9.66	1.132	18 55 43.26
SUN.	6	19 5 16.44	10.970	22 36 5.8	17.09	5 36.62	1.115	18 59 39.82
Mon.	7	19 9 39.53	10.952	22 29 2.2	+ 18.21	6 3.15	1.096	19 3 36.38
Tues.	8	19 14 2.16	10.933	22 21 31.9	19.31	6 29.23	1.077	19 7 32.93
Wed.	9	19 18 24.32	10.913	22 13 35.1	20.41	6 54.83	1.056	19 11 29.49
Thur.	10	19 22 45.98	10.891	22 5 12.3	+ 21.50	7 19.93	1.035	19 15 26.05
Frid.	11	19 27 7.10	10.868	21 56 23.4	22.58	7 44.50	1.012	19 19 22.60
Sat.	12	19 31 27.66	10.844	21 47 8.9	23.65	8 8.50	0.988	19 23 19.16
SUN.	13	19 35 47.64	10.819	21 37 29.0	+ 24.70	8 31.92	0.963	19 27 15.72
Mon.	14	19 40 6.99	10.793	21 27 24.0	25.73	8 54.72	0.937	19 31 12.27
Tues.	15	19 44 25.71	10.766	21 16 54.0	26.76	9 16.88	0.910	19 35 8.83
Wed.	16	19 48 43.76	10.738	21 5 59.6	+ 27.77	9 38.37	0.881	19 39 5.39
Thur.	17	19 53 1.12	10.709	20 54 41.0	28.77	9 59.18	0.852	19 43 1.94
Frid.	18	19 57 17.77	10.679	20 42 58.4	29.75	10 19.27	0.822	19 46 58.50
Sat.	19	20 1 33.69	10.648	20 30 52.3	+ 30.73	10 38.63	0.791	19 50 55.06
SUN.	20	20 5 48.86	10.616	20 18 23.0	31.69	10 57.25	0.759	19 54 51.61
Mon.	21	20 10 3.26	10.584	20 5 30.8	32.64	11 15.09	0.727	19 58 48.17
Tues.	22	20 14 16.90	10.552	19 52 16.1	+ 33.57	11 32.17	0.695	20 2 44.73
Wed.	23	20 18 29.75	10.519	19 38 39.2	34.49	11 48.47	0.662	20 6 41.28
Thur.	24	20 22 41.81	10.486	19 24 40.5	35.38	12 3.97	0.629	20 10 37.84
Frid.	25	20 26 53.06	10.452	19 10 20.3	+ 36.27	12 18.66	0.596	20 14 34.40
Sat.	26	20 31 3.51	10.418	18 55 39.1	37.14	12 32.56	0.562	20 18 30.95
SUN.	27	20 35 13.15	10.385	18 40 37.2	38.00	12 45.64	0.528	20 22 27.51
Mon.	28	20 39 21.98	10.351	18 25 14.9	+ 38.84	12 57.92	0.494	20 26 24.06
Tues.	29	20 43 29.98	10.317	18 9 32.8	39.66	13 9.36	0.460	20 30 20.62
Wed.	30	20 47 37.17	10.283	17 53 31.1	40.47	13 19.99	0.426	20 34 17.18
Thur.	31	20 51 43.55	10.249	17 37 10.2	41.25	13 29.82	0.392	20 38 13.73
Frid.	32	20 55 49.12	10.215	S. 17 20 30.6	+ 42.03	13 38.83	0.358	20 42 10.29

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,  
+ 9<sup>h</sup> 85<sup>m</sup> 65<sup>s</sup>.  
(Table III.)

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.	
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
		° ' "	' "	"	"			h m s	
1	1	279 56 39.9	56 54.0	152.85	+ 0.21	9.992 6547	- 0.9	5 19 10.54	
2	2	280 57 48.5	58 2.4	152.86	0.34	9.992 6539	+ 0.2	5 15 14.62	
3	3	281 58 57.2	59 10.9	152.87	0.46	9.992 6558	1.3	5 11 18.71	
4	4	283 0 6.0	0 19.6	152.88	+ 0.57	9.992 6603	+ 2.4	5 7 22.80	
5	5	284 1 15.0	1 28.5	152.88	0.69	9.992 6675	3.5	5 3 26.89	
6	6	285 2 24.2	2 37.5	152.89	0.77	9.992 6773	4.5	4 59 30.98	
7	7	286 3 33.6	3 46.7	152.89	+ 0.81	9.992 6894	+ 5.4	4 55 35.07	
8	8	287 4 43.1	4 56.0	152.90	0.83	9.992 7038	6.4	4 51 39.16	
9	9	288 5 52.7	6 5.4	152.90	0.83	9.992 7204	7.3	4 47 43.25	
10	10	289 7 2.3	7 14.8	152.90	+ 0.78	9.992 7389	+ 8.1	4 43 47.34	
11	11	290 8 11.9	8 24.3	152.90	0.71	9.992 7592	8.8	4 39 51.42	
12	12	291 9 21.3	9 33.6	152.89	0.59	9.992 7813	9.5	4 35 55.51	
13	13	292 10 30.5	10 42.6	152.88	+ 0.48	9.992 8049	+ 10.2	4 31 59.60	
14	14	293 11 39.4	11 51.4	152.86	0.34	9.992 8301	10.9	4 28 3.69	
15	15	294 12 47.9	12 59.6	152.84	0.21	9.992 8568	11.5	4 24 7.78	
16	16	295 13 55.7	14 7.3	152.81	+ 0.08	9.992 8851	+ 12.1	4 20 11.87	
17	17	296 15 2.9	15 14.4	152.78	- 0.04	9.992 9150	12.8	4 16 15.96	
18	18	297 16 9.3	16 20.6	152.75	0.14	9.992 9466	13.5	4 12 20.05	
19	19	298 17 14.9	17 26.0	152.71	- 0.22	9.992 9801	+ 14.3	4 8 24.14	
20	20	299 18 19.6	18 30.5	152.68	0.28	9.993 0155	15.1	4 4 28.23	
21	21	300 19 23.3	19 34.1	152.64	0.30	9.993 0529	16.0	4 0 32.32	
22	22	301 20 26.0	20 36.7	152.60	- 0.30	9.993 0925	+ 16.9	3 56 36.41	
23	23	302 21 27.8	21 38.3	152.56	0.25	9.993 1343	17.9	3 52 40.50	
24	24	303 22 28.5	22 38.9	152.52	0.20	9.993 1785	18.9	3 48 44.58	
25	25	304 23 28.2	23 38.4	152.47	- 0.11	9.993 2250	+ 19.9	3 44 48.67	
26	26	305 24 26.9	24 37.0	152.43	- 0.01	9.993 2741	20.9	3 40 52.76	
27	27	306 25 24.6	25 34.5	152.38	+ 0.11	9.993 3256	22.0	3 36 56.85	
28	28	307 26 21.3	26 31.1	152.34	+ 0.24	9.993 3797	+ 23.1	3 33 0.94	
29	29	308 27 17.0	27 26.6	152.30	0.38	9.993 4363	24.1	3 29 5.03	
30	30	309 28 11.6	28 21.1	152.26	0.51	9.993 4955	25.2	3 25 9.12	
31	31	310 29 5.3	29 14.7	152.22	0.65	9.993 5572	26.2	3 21 13.21	
32	32	311 29 58.1	30 7.3	152.18	+ 0.75	9.993 6214	+ 27.3	3 17 17.30	

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,  
— 9<sup>s</sup>.8296.  
(Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	' "	' "	' "	"	' "	"	h m	m	d
1	14 53.5	14 56.1	54 33.2	+ 0.76	54 42.8	+ 0.85	13 50.5	2.02	16.7
2	14 59.1	15 2.4	54 53.7	0.95	55 5.7	1.05	14 38.6	1.99	17.7
3	15 5.9	15 9.9	55 18.9	1.16	55 33.5	1.27	15 25.8	1.95	18.7
4	15 14.3	15 18.9	55 49.4	+ 1.40	56 6.5	+ 1.50	16 12.4	1.93	19.7
5	15 23.9	15 29.3	56 25.0	1.60	56 44.8	1.68	16 58.9	1.94	20.7
6	15 35.1	15 41.1	57 5.8	1.78	57 27.9	1.88	17 45.9	1.98	21.7
7	15 47.3	15 53.7	57 50.8	+ 1.94	58 14.4	+ 1.98	18 34.3	2.06	22.7
8	16 0.2	16 6.7	58 38.3	1.98	59 2.0	1.95	19 25.1	2.18	23.7
9	16 13.0	16 19.0	59 25.1	1.88	59 47.2	1.77	20 19.1	2.33	24.7
10	16 24.5	16 29.4	60 7.5	+ 1.60	60 25.5	+ 1.38	21 16.9	2.49	25.7
11	16 33.5	16 36.6	60 40.6	1.11	60 52.1	0.80	22 18.1	2.61	26.7
12	16 38.7	16 39.6	60 59.7	+ 0.44	61 2.8	+ 0.08	23 21.3	2.64	27.7
13	16 39.2	16 37.5	61 1.4	- 0.31	60 55.3	- 0.70	0	.	28.7
14	16 34.6	16 30.6	60 44.7	1.06	60 29.8	1.40	0 24.3	2.59	0.3
15	16 25.5	16 19.5	60 11.1	1.70	59 49.1	1.95	1 24.9	2.44	1.3
16	16 12.8	16 5.5	59 24.3	- 2.14	58 57.7	- 2.28	2 21.7	2.28	2.3
17	15 57.9	15 50.2	58 29.8	2.35	58 1.3	2.38	3 14.5	2.12	3.3
18	15 42.4	15 34.8	57 32.8	2.35	57 4.9	2.28	4 3.7	1.98	4.3
19	15 27.5	15 20.6	56 38.0	- 2.17	56 12.7	- 2.03	4 50.1	1.89	5.3
20	15 14.2	15 8.4	55 49.2	1.87	55 27.8	1.69	5 34.7	1.84	6.3
21	15 3.1	14 58.6	55 8.7	1.49	54 52.0	1.28	6 18.5	1.82	7.3
22	14 54.8	14 51.6	54 37.8	- 1.08	54 26.1	- 0.87	7 2.3	1.84	8.3
23	14 49.1	14 47.2	54 16.9	0.66	54 10.2	0.46	7 46.8	1.88	9.3
24	14 46.1	14 45.5	54 5.8	- 0.27	54 3.7	- 0.09	8 32.5	1.93	10.3
25	14 45.5	14 46.0	54 3.7	+ 0.08	54 5.6	+ 0.24	9 19.6	1.99	11.3
26	14 47.0	14 48.5	54 9.4	0.38	54 14.8	0.51	10 7.8	2.03	12.3
27	14 50.4	14 52.6	54 21.7	0.63	54 29.9	0.73	10 56.8	2.05	13.3
28	14 55.1	14 58.0	54 39.2	+ 0.82	54 49.6	+ 0.90	11 46.1	2.05	14.3
29	15 1.0	15 4.3	55 0.7	0.96	55 12.7	1.02	12 35.1	2.02	15.3
30	15 7.7	15 11.2	55 25.2	1.07	55 38.3	1.11	13 23.3	1.99	16.3
31	15 14.9	15 18.8	55 51.9	1.15	56 6.0	1.19	14 10.7	1.96	17.3
32	15 22.7	15 26.7	56 20.4	+ 1.22	56 35.2	+ 1.25	14 57.5	1.95	18.3

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 1.					THURSDAY 3.				
0	h m s		N. 20 5 1.5	3.432	0	h m s		N. 15 34 24.9	7.684
1	8 3 14.30	2.1322	20 1 32.7	3.528	1	9 44 22.21	2.0765	15 26 41.5	7.762
2	8 5 22.21	2.1315	19 57 58.1	3.626	2	9 46 26.76	2.0751	15 18 53.5	7.838
3	8 7 30.08	2.1307	19 54 17.6	3.722	3	9 48 31.22	2.0737	15 11 0.9	7.914
4	8 9 37.90	2.1300	19 50 31.4	3.818	4	9 50 35.61	2.0725	15 3 3.8	7.990
5	8 11 45.68	2.1292	19 46 39.4	3.915	5	9 52 39.92	2.0712	14 55 2.1	8.065
6	8 13 53.41	2.1284	19 42 41.6	4.011	6	9 54 44.16	2.0700	14 46 56.0	8.139
7	8 16 1.09	2.1276	19 38 38.1	4.106	7	9 56 48.32	2.0687	14 38 45.4	8.214
8	8 18 8.72	2.1267	19 34 28.9	4.201	8	9 58 52.40	2.0674	14 30 30.3	8.287
9	8 20 16.29	2.1257	19 30 14.0	4.296	9	10 0 56.41	2.0662	14 22 10.9	8.359
10	8 22 23.81	2.1248	19 25 53.4	4.390	10	10 3 0.34	2.0649	14 13 47.2	8.432
11	8 24 31.27	2.1238	19 21 27.2	4.485	11	10 5 4.20	2.0637	14 5 19.1	8.503
12	8 26 38.67	2.1229	19 16 55.2	4.580	12	10 7 7.98	2.0625	13 56 46.8	8.574
13	8 28 46.02	2.1220	19 12 17.6	4.673	13	10 9 11.70	2.0614	13 48 10.2	8.645
14	8 30 53.31	2.1209	19 7 34.5	4.766	14	10 11 15.35	2.0602	13 39 29.4	8.715
15	8 33 0.53	2.1198	19 2 45.7	4.859	15	10 13 18.92	2.0590	13 30 44.4	8.784
16	8 35 7.69	2.1187	18 57 51.4	4.951	16	10 15 22.43	2.0579	13 21 55.3	8.852
17	8 37 14.78	2.1176	18 52 51.6	5.043	17	10 17 25.87	2.0568	13 13 2.1	8.920
18	8 39 21.80	2.1165	18 47 46.2	5.135	18	10 19 29.25	2.0557	13 4 4.9	8.987
19	8 41 28.76	2.1154	18 42 35.4	5.226	19	10 21 32.56	2.0547	12 55 3.6	9.055
20	8 43 35.65	2.1142	18 37 19.1	5.317	20	10 23 35.81	2.0537	12 45 58.3	9.121
21	8 45 42.47	2.1131	18 31 57.3	5.408	21	10 25 39.00	2.0527	12 36 49.1	9.186
22	8 47 49.22	2.1119	18 26 30.1	5.499	22	10 27 42.13	2.0517	12 27 36.0	9.251
23	8 49 55.90	2.1107	N. 18 20 57.4	5.588	23	10 29 45.20	2.0507	N. 12 18 19.0	9.315
24	8 52 2.51	2.1095				10 31 48.21	2.0497		
WEDNESDAY 2.					FRIDAY 4.				
0	h m s		N. 18 15 19.5	5.677	0	h m s		N. 12 8 58.2	9.378
1	8 54 9.04	2.1082	18 9 36.2	5.767	1	10 33 51.17	2.0489	11 59 33.6	9.442
2	8 56 15.50	2.1070	18 3 47.5	5.856	2	10 35 54.08	2.0480	11 50 5.1	9.505
3	8 58 21.88	2.1057	17 57 53.5	5.943	3	10 37 56.93	2.0471	11 40 33.0	9.566
4	9 0 28.18	2.1044	17 51 54.3	6.031	4	10 39 59.73	2.0462	11 30 57.2	9.627
5	9 2 34.41	2.1032	17 45 49.8	6.119	5	10 42 2.48	2.0453	11 21 17.7	9.688
6	9 4 40.56	2.1018	17 39 40.0	6.206	6	10 44 5.19	2.0447	11 11 34.6	9.747
7	9 6 46.63	2.1005	17 33 25.1	6.292	7	10 46 7.85	2.0440	11 1 48.0	9.807
8	9 8 52.62	2.0992	17 27 5.0	6.377	8	10 48 10.47	2.0433	10 51 57.8	9.865
9	9 10 58.53	2.0979	17 20 39.8	6.462	9	10 50 13.05	2.0427	10 42 4.2	9.923
10	9 13 4.37	2.0967	17 14 9.5	6.547	10	10 52 15.59	2.0420	10 32 7.0	9.981
11	9 15 10.13	2.0953	17 7 34.1	6.632	11	10 54 18.09	2.0414	10 22 6.5	10.037
12	9 17 15.80	2.0938	17 0 53.7	6.716	12	10 56 20.56	2.0408	10 12 2.6	10.092
13	9 19 21.39	2.0925	16 54 8.2	6.800	13	10 58 22.99	2.0402	10 1 55.4	10.147
14	9 21 26.90	2.0912	16 47 17.7	6.882	14	11 0 25.39	2.0398	9 51 44.9	10.202
15	9 23 32.34	2.0899	16 40 22.3	6.965	15	11 2 27.77	2.0394	9 41 31.1	10.256
16	9 25 37.69	2.0885	16 33 21.9	7.047	16	11 4 30.12	2.0389	9 31 14.2	10.309
17	9 27 42.96	2.0872	16 26 16.6	7.129	17	11 6 32.44	2.0385	9 20 54.0	10.362
18	9 29 48.15	2.0857	16 19 6.4	7.210	18	11 8 34.74	2.0382	9 10 30.7	10.413
19	9 31 53.25	2.0844	16 11 51.4	7.290	19	11 10 37.02	2.0379	9 0 4.4	10.464
20	9 33 58.28	2.0832	16 4 31.6	7.370	20	11 12 39.29	2.0377	8 49 35.0	10.515
21	9 36 3.23	2.0818	15 57 7.0	7.449	21	11 14 41.54	2.0374	8 39 2.6	10.565
22	9 38 8.10	2.0804	15 49 37.7	7.528	22	11 16 43.78	2.0372	8 28 27.2	10.614
23	9 40 12.88	2.0790	15 42 3.6	7.607	23	11 18 46.01	2.0371	8 17 48.9	10.662
24	9 42 17.58	2.0777	N. 15 34 24.9	7.684	24	11 20 48.23	2.0370	N. 8 7 7.7	10.710
	9 44 22.21	2.0765				11 22 50.45	2.0370		



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 5.					MONDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	11 22 50.45	2.0370	N. 8 7 7.7	10.710	1	13 1 30.98	2.0958	S. 1 7 27.2	12.082
2	11 24 52.67	2.0370	7 56 23.7	10.757	2	13 3 36.81	2.0985	1 19 32.4	12.090
3	11 26 54.89	2.0370	7 45 36.9	10.803	3	13 5 42.80	2.1012	1 31 38.0	12.097
4	11 28 57.11	2.0371	7 34 47.3	10.849	4	13 7 48.96	2.1040	1 43 44.0	12.102
5	11 30 59.34	2.0373	7 23 55.0	10.893	5	13 9 55.28	2.1068	1 55 50.3	12.107
6	11 33 1.58	2.0374	7 13 0.1	10.937	6	13 12 1.78	2.1098	2 7 56.8	12.110
7	11 35 3.83	2.0377	7 2 2.5	10.981	7	13 14 8.46	2.1127	2 20 3.5	12.112
8	11 37 6.10	2.0379	6 51 2.4	11.023	8	13 16 15.31	2.1157	2 32 10.3	12.113
9	11 39 8.38	2.0383	6 39 59.7	11.066	9	13 18 22.35	2.1189	2 44 17.1	12.113
10	11 41 10.69	2.0387	6 28 54.5	11.107	10	13 20 29.58	2.1221	2 56 23.9	12.112
11	11 43 13.02	2.0390	6 17 46.9	11.147	11	13 22 37.00	2.1252	3 8 30.6	12.111
12	11 45 15.37	2.0395	6 6 36.9	11.186	12	13 24 44.61	2.1285	3 20 37.2	12.108
13	11 47 17.76	2.0401	5 55 24.6	11.225	13	13 26 52.42	2.1318	3 32 43.6	12.104
14	11 49 20.18	2.0406	5 44 9.9	11.263	14	13 29 0.43	2.1353	3 44 49.7	12.099
15	11 51 22.63	2.0412	5 32 53.0	11.300	15	13 31 8.65	2.1387	3 56 55.5	12.093
16	11 53 25.12	2.0419	5 21 33.9	11.337	16	13 33 17.08	2.1423	4 9 0.9	12.087
17	11 55 27.66	2.0427	5 10 12.5	11.373	17	13 35 25.73	2.1459	4 21 5.9	12.078
18	11 57 30.24	2.0434	4 58 49.1	11.407	18	13 37 34.59	2.1495	4 33 10.3	12.068
19	11 59 32.87	2.0442	4 47 23.6	11.442	19	13 39 43.67	2.1533	4 45 14.1	12.058
20	12 1 35.55	2.0452	4 35 56.0	11.477	20	13 41 52.98	2.1571	4 57 17.2	12.047
21	12 3 38.29	2.0461	4 24 26.4	11.509	21	13 44 2.52	2.1609	5 9 19.7	12.034
22	12 5 41.08	2.0470	4 12 54.9	11.541	22	13 46 12.29	2.1647	5 21 21.3	12.019
23	12 7 43.93	2.0481	4 1 21.5	11.572	23	13 48 22.29	2.1687	5 33 22.0	12.004
24	12 9 46.85	2.0492	N. 3 49 46.3	11.602	24	13 50 32.53	2.1727	S. 5 45 21.8	11.988
SUNDAY 6.					TUESDAY 8.				
0	12 11 49.84	2.0504	N. 3 38 9.2	11.632	0	13 52 43.02	2.1768	S. 5 57 20.6	11.971
1	12 13 52.90	2.0516	3 26 30.4	11.661	1	13 54 53.75	2.1809	6 9 18.3	11.952
2	12 15 56.03	2.0528	3 14 49.9	11.688	2	13 57 4.73	2.1852	6 21 14.8	11.932
3	12 17 59.24	2.0542	3 3 7.8	11.715	3	13 59 15.97	2.1894	6 33 10.1	11.911
4	12 20 2.54	2.0557	2 51 24.1	11.742	4	14 1 27.46	2.1938	6 45 4.1	11.888
5	12 22 5.92	2.0570	2 39 38.8	11.768	5	14 3 39.22	2.1982	6 56 56.7	11.865
6	12 24 9.38	2.0585	2 27 52.0	11.792	6	14 5 51.24	2.2025	7 8 47.9	11.841
7	12 26 12.94	2.0602	2 16 3.8	11.815	7	14 8 3.52	2.2070	7 20 37.6	11.815
8	12 28 16.60	2.0617	2 4 14.2	11.838	8	14 10 16.08	2.2116	7 32 25.7	11.787
9	12 30 20.35	2.0634	1 52 23.2	11.861	9	14 12 28.91	2.2162	7 44 12.0	11.758
10	12 32 24.21	2.0652	1 40 30.9	11.882	10	14 14 42.02	2.2208	7 55 56.7	11.729
11	12 34 28.17	2.0669	1 28 37.4	11.902	11	14 16 55.41	2.2255	8 7 39.5	11.697
12	12 36 32.24	2.0688	1 16 42.6	11.922	12	14 19 9.08	2.2303	8 19 20.4	11.665
13	12 38 36.43	2.0707	1 4 46.7	11.940	13	14 21 23.04	2.2351	8 30 59.3	11.631
14	12 40 40.73	2.0727	0 52 49.8	11.958	14	14 23 37.29	2.2400	8 42 36.1	11.596
15	12 42 45.15	2.0748	0 40 51.8	11.975	15	14 25 51.84	2.2449	8 54 10.8	11.559
16	12 44 49.70	2.0768	0 28 52.8	11.990	16	14 28 6.68	2.2498	9 5 43.2	11.522
17	12 46 54.37	2.0790	0 16 53.0	12.005	17	14 30 21.82	2.2548	9 17 13.4	11.482
18	12 48 59.18	2.0812	N. 0 4 52.2	12.020	18	14 32 37.26	2.2599	9 28 41.1	11.442
19	12 51 4.12	2.0835	S. 0 7 9.4	12.032	19	14 34 53.01	2.2651	9 40 6.4	11.401
20	12 53 9.20	2.0858	0 19 11.7	12.044	20	14 37 9.07	2.2702	9 51 29.2	11.357
21	12 55 14.42	2.0883	0 31 14.7	12.055	21	14 39 25.44	2.2754	10 2 49.2	11.312
22	12 57 19.79	2.0908	0 43 18.3	12.065	22	14 41 42.12	2.2807	10 14 6.6	11.267
23	12 59 25.31	2.0933	0 55 22.5	12.074	23	14 43 59.12	2.2859	10 25 21.2	11.219
24	13 1 30.98	2.0958	S. 1 7 27.2	12.082	24	14 46 16.43	2.2912	S. 10 36 32.9	11.170

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 9.					FRIDAY 11.				
0	14 46 16.43	2.2912	S. 10 36 32.9	11.170	0	16 42 49.44	2.5643	S. 18 7 48.4	7.042
1	14 48 34.06	2.2966	10 47 41.6	11.119	1	16 45 23.46	2.5695	18 14 47.3	6.920
2	14 50 52.02	2.3021	10 58 47.2	11.067	2	16 47 57.78	2.5746	18 21 38.8	6.795
3	14 53 10.31	2.3076	11 9 49.7	11.015	3	16 50 32.41	2.5797	18 28 22.7	6.669
4	14 55 28.93	2.3130	11 20 49.0	10.960	4	16 53 7.34	2.5847	18 34 59.1	6.542
5	14 57 47.87	2.3185	11 31 44.9	10.903	5	16 55 42.57	2.5896	18 41 27.8	6.413
6	15 0 7.15	2.3241	11 42 37.4	10.846	6	16 58 18.09	2.5943	18 47 48.7	6.283
7	15 2 26.76	2.3297	11 53 26.4	10.787	7	17 0 53.89	2.5990	18 54 1.8	6.152
8	15 4 46.71	2.3352	12 4 11.8	10.726	8	17 3 29.97	2.6037	19 0 7.0	6.020
9	15 7 6.99	2.3408	12 14 53.5	10.664	9	17 6 6.33	2.6083	19 6 4.2	5.887
10	15 9 27.61	2.3466	12 25 31.5	10.601	10	17 8 42.97	2.6128	19 11 53.4	5.752
11	15 11 48.58	2.3523	12 36 5.6	10.536	11	17 11 19.87	2.6172	19 17 34.4	5.615
12	15 14 9.89	2.3580	12 46 35.8	10.469	12	17 13 57.03	2.6215	19 23 7.2	5.477
13	15 16 31.54	2.3637	12 57 1.9	10.401	13	17 16 34.45	2.6257	19 28 31.7	5.339
14	15 18 53.54	2.3696	13 7 23.9	10.331	14	17 19 12.12	2.6299	19 33 47.9	5.200
15	15 21 15.89	2.3754	13 17 41.6	10.260	15	17 21 50.04	2.6339	19 38 55.7	5.059
16	15 23 38.59	2.3812	13 27 55.1	10.187	16	17 24 28.19	2.6377	19 43 55.0	4.917
17	15 26 1.64	2.3871	13 38 4.1	10.112	17	17 27 6.57	2.6416	19 48 45.7	4.773
18	15 28 25.04	2.3929	13 48 8.6	10.037	18	17 29 45.18	2.6453	19 53 27.8	4.630
19	15 30 48.79	2.3987	13 58 8.5	9.960	19	17 32 24.01	2.6489	19 58 1.3	4.486
20	15 33 12.89	2.4046	14 8 3.8	9.881	20	17 35 3.05	2.6523	20 2 26.1	4.339
21	15 35 37.34	2.4105	14 17 54.2	9.800	21	17 37 42.29	2.6557	20 6 42.0	4.198
22	15 38 2.15	2.4164	14 27 39.8	9.718	22	17 40 21.74	2.6591	20 10 49.1	4.044
23	15 40 27.31	2.4222	S. 14 37 20.4	9.635	23	17 43 1.38	2.6622	S. 20 14 47.3	3.895
THURSDAY 10.					SATURDAY 12.				
0	15 42 52.82	2.4282	S. 14 46 56.0	9.550	0	17 45 41.20	2.6652	S. 20 18 36.5	3.745
1	15 45 18.69	2.4341	14 56 26.4	9.463	1	17 48 21.20	2.6681	20 22 16.7	3.595
2	15 47 44.91	2.4400	15 5 51.6	9.375	2	17 51 1.37	2.6708	20 25 47.9	3.443
3	15 50 11.49	2.4459	15 15 11.4	9.285	3	17 53 41.70	2.6735	20 29 9.9	3.291
4	15 52 38.42	2.4517	15 24 25.8	9.193	4	17 56 22.19	2.6760	20 32 22.8	3.139
5	15 55 5.70	2.4576	15 33 34.6	9.100	5	17 59 2.82	2.6783	20 35 26.6	2.986
6	15 57 33.33	2.4635	15 42 37.8	9.006	6	18 1 43.59	2.6806	20 38 21.1	2.831
7	16 0 1.32	2.4694	15 51 35.3	8.910	7	18 4 24.49	2.6827	20 41 6.3	2.676
8	16 2 29.66	2.4753	16 0 27.0	8.812	8	18 7 5.52	2.6847	20 43 42.2	2.521
9	16 4 58.35	2.4810	16 9 12.8	8.713	9	18 9 46.66	2.6866	20 46 8.8	2.366
10	16 7 27.38	2.4867	16 17 52.6	8.612	10	18 12 27.91	2.6883	20 48 26.1	2.209
11	16 9 56.76	2.4926	16 26 26.3	8.510	11	18 15 9.25	2.6898	20 50 33.9	2.052
12	16 12 26.49	2.4983	16 34 53.8	8.407	12	18 17 50.69	2.6913	20 52 32.3	1.894
13	16 14 56.56	2.5040	16 43 15.1	8.301	13	18 20 32.21	2.6926	20 54 21.2	1.737
14	16 17 26.97	2.5098	16 51 29.9	8.193	14	18 23 13.80	2.6937	20 56 0.7	1.578
15	16 19 57.73	2.5155	16 59 38.3	8.086	15	18 25 55.45	2.6947	20 57 30.6	1.420
16	16 22 28.83	2.5211	17 7 40.2	7.976	16	18 28 37.16	2.6956	20 58 51.1	1.262
17	16 25 0.26	2.5266	17 15 35.4	7.864	17	18 31 18.92	2.6963	21 0 2.0	1.102
18	16 27 32.02	2.5321	17 23 23.9	7.752	18	18 34 0.72	2.6968	21 1 3.3	0.942
19	16 30 4.11	2.5376	17 31 5.6	7.637	19	18 36 42.54	2.6973	21 1 55.1	0.784
20	16 32 36.53	2.5431	17 38 40.3	7.520	20	18 39 24.39	2.6976	21 2 37.4	0.624
21	16 35 9.28	2.5485	17 46 8.0	7.403	21	18 42 6.25	2.6977	21 3 10.0	0.464
22	16 37 42.35	2.5538	17 53 28.7	7.285	22	18 44 48.11	2.6976	21 3 33.1	0.305
23	16 40 15.74	2.5591	18 0 42.2	7.164	23	18 47 29.96	2.6974	21 3 46.6	-0.145
24	16 42 49.44	2.5643	S. 18 7 48.4	7.042	24	18 50 11.80	2.6972	S. 21 3 50.5	+0.015

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 13.					TUESDAY 15.				
0	18 50 11.80	2.6972	S. 21 3 50.5	+ 0.015	0	20 56 41.48	2.5291	S. 18 8 51.8	6.926
1	18 52 53.62	2.6967	21 3 44.8	0.174	1	20 59 13.05	2.5232	18 1 52.7	7.043
2	18 55 35.40	2.6960	21 3 29.6	0.333	2	21 1 44.26	2.5173	17 54 46.7	7.157
3	18 58 17.14	2.6952	21 3 4.8	0.493	3	21 4 15.12	2.5113	17 47 33.9	7.269
4	19 0 58.83	2.6943	21 2 30.4	0.652	4	21 6 45.62	2.5052	17 40 14.4	7.382
5	19 3 40.46	2.6932	21 1 46.5	0.811	5	21 9 15.75	2.4992	17 32 48.1	7.492
6	19 6 22.02	2.6921	21 0 53.1	0.969	6	21 11 45.52	2.4931	17 25 15.3	7.601
7	19 9 3.51	2.6907	20 59 50.2	1.128	7	21 14 14.92	2.4870	17 17 36.0	7.708
8	19 11 44.91	2.6892	20 58 37.8	1.285	8	21 16 43.96	2.4808	17 9 50.3	7.813
9	19 14 26.22	2.6876	20 57 16.0	1.443	9	21 19 12.62	2.4746	17 1 58.4	7.917
10	19 17 7.42	2.6857	20 55 44.7	1.600	10	21 21 40.91	2.4683	16 54 0.2	8.021
11	19 19 48.51	2.6839	20 54 4.0	1.757	11	21 24 8.82	2.4620	16 45 55.9	8.122
12	19 22 29.49	2.6819	20 52 13.8	1.914	12	21 26 36.35	2.4557	16 37 45.5	8.222
13	19 25 10.34	2.6797	20 50 14.3	2.069	13	21 29 3.50	2.4493	16 29 29.3	8.319
14	19 27 51.05	2.6772	20 48 5.5	2.223	14	21 31 30.27	2.4430	16 21 7.2	8.416
15	19 30 31.61	2.6747	20 45 47.5	2.377	15	21 33 56.66	2.4367	16 12 39.4	8.510
16	19 33 12.02	2.6722	20 43 20.2	2.532	16	21 36 22.67	2.4302	16 4 6.0	8.603
17	19 35 52.27	2.6694	20 40 43.6	2.686	17	21 38 48.29	2.4238	15 55 27.0	8.696
18	19 38 32.35	2.6665	20 37 57.9	2.837	18	21 41 13.53	2.4174	15 46 42.5	8.786
19	19 41 12.25	2.6635	20 35 3.2	2.988	19	21 43 38.38	2.4110	15 37 52.7	8.874
20	19 43 51.97	2.6604	20 31 59.3	3.140	20	21 46 2.85	2.4046	15 28 57.6	8.961
21	19 46 31.50	2.6572	20 28 46.4	3.290	21	21 48 26.93	2.3981	15 19 57.4	9.047
22	19 49 10.83	2.6538	20 25 24.5	3.439	22	21 50 50.62	2.3917	15 10 52.0	9.131
23	19 51 49.95	2.6502	S. 20 21 53.7	3.587	23	21 53 13.93	2.3853	S. 15 1 41.7	9.212
MONDAY 14.					WEDNESDAY 16.				
0	19 54 28.85	2.6465	S. 20 18 14.1	3.734	0	21 55 36.85	2.3787	S. 14 52 26.5	9.293
1	19 57 7.53	2.6427	20 14 25.6	3.881	1	21 57 59.38	2.3723	14 43 6.5	9.372
2	19 59 45.98	2.6389	20 10 28.4	4.026	2	22 0 21.53	2.3659	14 33 41.8	9.450
3	20 2 24.20	2.6349	20 6 22.5	4.171	3	22 2 43.29	2.3594	14 24 12.5	9.526
4	20 5 2.17	2.6308	20 2 7.9	4.314	4	22 5 4.66	2.3530	14 14 38.7	9.601
5	20 7 39.89	2.6266	19 57 44.8	4.457	5	22 7 25.65	2.3466	14 5 0.4	9.674
6	20 10 17.36	2.6223	19 53 13.1	4.598	6	22 9 46.25	2.3402	13 55 17.8	9.745
7	20 12 54.57	2.6179	19 48 33.0	4.737	7	22 12 6.47	2.3338	13 45 31.0	9.815
8	20 15 31.51	2.6133	19 43 44.6	4.876	8	22 14 26.31	2.3275	13 35 40.0	9.884
9	20 18 8.17	2.6087	19 38 47.9	5.014	9	22 16 45.77	2.3211	13 25 44.9	9.951
10	20 20 44.55	2.6040	19 33 42.9	5.151	10	22 19 4.84	2.3147	13 15 45.9	10.017
11	20 23 20.65	2.5992	19 28 29.8	5.286	11	22 21 23.54	2.3085	13 5 42.9	10.082
12	20 25 56.45	2.5942	19 23 8.6	5.420	12	22 23 41.86	2.3022	12 55 36.1	10.143
13	20 28 31.96	2.5892	19 17 39.4	5.553	13	22 25 59.80	2.2959	12 45 25.7	10.204
14	20 31 7.16	2.5841	19 12 2.2	5.685	14	22 28 17.37	2.2897	12 35 11.6	10.263
15	20 33 42.05	2.5789	19 6 17.2	5.815	15	22 30 34.57	2.2836	12 24 54.1	10.321
16	20 36 16.63	2.5738	19 0 24.4	5.944	16	22 32 51.40	2.2774	12 14 33.1	10.378
17	20 38 50.90	2.5684	18 54 23.9	6.072	17	22 35 7.86	2.2712	12 4 8.7	10.433
18	20 41 24.84	2.5629	18 48 15.7	6.198	18	22 37 23.95	2.2652	11 53 41.1	10.487
19	20 43 58.45	2.5575	18 42 0.1	6.323	19	22 39 39.68	2.2591	11 43 10.3	10.539
20	20 46 31.74	2.5520	18 35 37.0	6.447	20	22 41 55.04	2.2530	11 32 36.4	10.590
21	20 49 4.69	2.5463	18 29 6.5	6.568	21	22 44 10.04	2.2470	11 21 59.5	10.639
22	20 51 37.30	2.5406	18 22 28.8	6.689	22	22 46 24.68	2.2411	11 11 19.7	10.687
23	20 54 9.56	2.5348	18 15 43.8	6.808	23	22 48 38.97	2.2352	11 0 37.0	10.734
24	20 56 41.48	2.5291	S. 18 8 51.8	6.926	24	22 50 52.90	2.2292	S. 10 49 51.6	10.779

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 17.					SATURDAY 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 50 52.90	2.2292	S. 10 49 51.6	10.779	0	0 32 5.86	2.0104	S. 1 43 36.5	11.564
1	22 53 6.48	2.2234	10 39 3.5	10.823	1	0 34 6.39	2.0073	1 32 2.9	11.556
2	22 55 19.71	2.2177	10 28 12.8	10.866	2	0 36 6.74	2.0043	1 20 29.8	11.547
3	22 57 32.60	2.2120	10 17 19.6	10.907	3	0 38 6.91	2.0014	1 8 57.2	11.538
4	22 59 45.15	2.2062	10 6 24.0	10.947	4	0 40 6.91	1.9986	0 57 25.2	11.529
5	23 1 57.35	2.2005	9 55 26.0	10.986	5	0 42 6.74	1.9957	0 45 53.9	11.516
6	23 4 9.21	2.1949	9 44 25.7	11.023	6	0 44 6.39	1.9928	0 34 23.3	11.504
7	23 6 20.74	2.1894	9 33 23.2	11.058	7	0 46 5.88	1.9902	0 22 53.4	11.492
8	23 8 31.94	2.1839	9 22 18.7	11.093	8	0 48 5.22	1.9877	S. 0 11 24.3	11.478
9	23 10 42.81	2.1784	9 11 12.0	11.127	9	0 50 4.40	1.9851	N. 0 0 4.0	11.464
10	23 12 53.35	2.1730	9 0 3.4	11.159	10	0 52 3.43	1.9826	0 11 31.4	11.448
11	23 15 3.57	2.1677	8 48 52.9	11.190	11	0 54 2.31	1.9801	0 22 57.8	11.432
12	23 17 13.47	2.1623	8 37 40.6	11.219	12	0 56 1.04	1.9777	0 34 23.3	11.417
13	23 19 23.05	2.1571	8 26 26.6	11.248	13	0 57 59.63	1.9754	0 45 47.8	11.399
14	23 21 32.32	2.1519	8 15 10.8	11.276	14	0 59 58.09	1.9732	0 57 11.2	11.381
15	23 23 41.28	2.1468	8 3 53.5	11.301	15	1 1 56.41	1.9709	1 8 33.5	11.362
16	23 25 49.93	2.1417	7 52 34.7	11.326	16	1 3 54.60	1.9688	1 19 54.7	11.343
17	23 27 58.28	2.1367	7 41 14.4	11.350	17	1 5 52.67	1.9668	1 31 14.7	11.322
18	23 30 6.33	2.1317	7 29 52.7	11.372	18	1 7 50.61	1.9647	1 42 33.4	11.302
19	23 32 14.08	2.1267	7 18 29.7	11.394	19	1 9 48.44	1.9628	1 53 50.9	11.281
20	23 34 21.54	2.1219	7 7 5.4	11.414	20	1 11 46.15	1.9609	2 5 7.1	11.258
21	23 36 28.71	2.1171	6 55 40.0	11.433	21	1 13 43.75	1.9591	2 16 21.9	11.236
22	23 38 35.59	2.1123	6 44 13.4	11.452	22	1 15 41.24	1.9573	2 27 35.4	11.212
23	23 40 42.19	2.1077	S. 6 32 45.8	11.468	23	1 17 38.62	1.9556	N. 2 38 47.4	11.187
FRIDAY 18.					SUNDAY 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 42 48.51	2.1030	S. 6 21 17.2	11.484	0	1 19 35.91	1.9540	N. 2 49 57.9	11.162
1	23 44 54.55	2.0984	6 9 47.7	11.498	1	1 21 33.10	1.9523	3 1 6.9	11.137
2	23 47 0.32	2.0940	5 58 17.4	11.512	2	1 23 30.19	1.9508	3 12 14.4	11.112
3	23 49 5.83	2.0896	5 46 46.3	11.525	3	1 25 27.20	1.9494	3 23 20.3	11.085
4	23 51 11.07	2.0851	5 35 14.4	11.537	4	1 27 24.12	1.9480	3 34 24.6	11.057
5	23 53 16.04	2.0807	5 23 41.8	11.547	5	1 29 20.96	1.9467	3 45 27.2	11.029
6	23 55 20.76	2.0765	5 12 8.7	11.556	6	1 31 17.72	1.9453	3 56 28.1	11.000
7	23 57 25.22	2.0723	5 0 35.1	11.565	7	1 33 14.40	1.9441	4 7 27.2	10.971
8	23 59 29.44	2.0682	4 49 0.9	11.573	8	1 35 11.01	1.9429	4 18 24.6	10.942
9	0 1 33.41	2.0641	4 37 26.3	11.579	9	1 37 7.55	1.9418	4 29 20.2	10.911
10	0 3 37.13	2.0600	4 25 51.4	11.584	10	1 39 4.02	1.9407	4 40 13.9	10.880
11	0 5 40.61	2.0561	4 14 16.2	11.589	11	1 41 0.43	1.9398	4 51 5.8	10.848
12	0 7 43.86	2.0522	4 2 40.7	11.592	12	1 42 56.79	1.9388	5 1 55.7	10.816
13	0 9 46.88	2.0484	3 51 5.1	11.595	13	1 44 53.09	1.9379	5 12 43.7	10.783
14	0 11 49.67	2.0446	3 39 29.3	11.597	14	1 46 49.34	1.9371	5 23 29.6	10.749
15	0 13 52.23	2.0409	3 27 53.5	11.597	15	1 48 45.54	1.9362	5 34 13.6	10.716
16	0 15 54.58	2.0373	3 16 17.6	11.597	16	1 50 41.69	1.9355	5 44 55.5	10.681
17	0 17 56.71	2.0337	3 4 41.8	11.596	17	1 52 37.80	1.9349	5 55 35.3	10.645
18	0 19 58.62	2.0302	2 53 6.1	11.594	18	1 54 33.88	1.9343	6 6 12.9	10.609
19	0 22 0.33	2.0267	2 41 30.5	11.592	19	1 56 29.92	1.9337	6 16 48.4	10.573
20	0 24 1.83	2.0233	2 29 55.1	11.588	20	1 58 25.93	1.9332	6 27 21.7	10.537
21	0 26 3.13	2.0200	2 18 19.9	11.583	21	2 0 21.91	1.9327	6 37 52.8	10.498
22	0 28 4.23	2.0168	2 6 45.1	11.577	22	2 2 17.86	1.9323	6 48 21.5	10.460
23	0 30 5.14	2.0136	1 55 10.6	11.572	23	2 4 13.79	1.9320	6 58 48.0	10.422
24	0 32 5.86	2.0104	S. 1 43 36.5	11.564	24	2 6 9.70	1.9317	N. 7 9 12.1	10.382

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 21.					WEDNESDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	2 6 9.70	1.9317	N. 7 9 12.1	10.382	0	3 39 26.07	1.9703	N. 14 32 17.0	7.881
1	2 8 5.60	1.9315	7 19 33.9	10.342	1	3 41 24.34	1.9720	14 40 7.9	7.816
2	2 10 1.48	1.9312	7 29 53.2	10.302	2	3 43 22.71	1.9737	14 47 54.9	7.751
3	2 11 57.35	1.9311	7 40 10.2	10.262	3	3 45 21.19	1.9755	14 55 38.0	7.685
4	2 13 53.21	1.9310	7 50 24.7	10.220	4	3 47 19.77	1.9772	15 3 17.1	7.618
5	2 15 49.07	1.9310	8 0 36.6	10.178	5	3 49 18.46	1.9790	15 10 52.2	7.552
6	2 17 44.93	1.9310	8 10 46.0	10.136	6	3 51 17.25	1.9808	15 18 23.3	7.484
7	2 19 40.79	1.9311	8 20 52.9	10.093	7	3 53 16.15	1.9827	15 25 50.3	7.417
8	2 21 36.66	1.9312	8 30 57.2	10.049	8	3 55 15.17	1.9846	15 33 13.3	7.349
9	2 23 32.54	1.9313	8 40 58.8	10.005	9	3 57 14.30	1.9864	15 40 32.2	7.280
10	2 25 28.42	1.9315	8 50 57.8	9.961	10	3 59 13.54	1.9883	15 47 46.9	7.211
11	2 27 24.32	1.9318	9 0 54.1	9.915	11	4 1 12.90	1.9902	15 54 57.5	7.142
12	2 29 20.24	1.9322	9 10 47.6	9.869	12	4 3 12.37	1.9922	16 2 3.9	7.072
13	2 31 16.18	1.9325	9 20 38.4	9.823	13	4 5 11.96	1.9941	16 9 6.1	7.001
14	2 33 12.14	1.9328	9 30 26.4	9.777	14	4 7 11.66	1.9961	16 16 4.0	6.929
15	2 35 8.12	1.9332	9 40 11.6	9.729	15	4 9 11.49	1.9982	16 22 57.6	6.857
16	2 37 4.13	1.9337	9 49 53.9	9.682	16	4 11 11.44	2.0001	16 29 46.9	6.786
17	2 39 0.17	1.9343	9 59 33.4	9.633	17	4 13 11.50	2.0021	16 36 31.9	6.713
18	2 40 56.25	1.9349	10 9 9.9	9.584	18	4 15 11.69	2.0042	16 43 12.5	6.640
19	2 42 52.36	1.9355	10 18 43.5	9.535	19	4 17 12.00	2.0062	16 49 48.7	6.567
20	2 44 48.51	1.9362	10 28 14.1	9.485	20	4 19 12.43	2.0082	16 56 20.5	6.492
21	2 46 44.70	1.9369	10 37 41.7	9.435	21	4 21 12.99	2.0104	17 2 47.8	6.417
22	2 48 40.94	1.9377	10 47 6.3	9.383	22	4 23 13.68	2.0125	17 9 10.6	6.342
23	2 50 37.22	1.9384	N. 10 56 27.7	9.332	23	4 25 14.49	2.0145	N. 17 15 28.9	6.267
TUESDAY 22.					THURSDAY 24.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	2 52 33.55	1.9392	N. 11 5 46.1	9.281	0	4 27 15.42	2.0166	N. 17 21 42.6	6.191
1	2 54 29.93	1.9402	11 15 1.4	9.228	1	4 29 16.48	2.0188	17 27 51.8	6.115
2	2 56 26.37	1.9411	11 24 13.5	9.175	2	4 31 17.67	2.0208	17 33 56.4	6.037
3	2 58 22.86	1.9420	11 33 22.4	9.121	3	4 33 18.98	2.0230	17 39 56.3	5.959
4	3 0 19.41	1.9430	11 42 28.0	9.067	4	4 35 20.43	2.0252	17 45 51.5	5.882
5	3 2 16.02	1.9440	11 51 30.4	9.013	5	4 37 22.01	2.0273	17 51 42.1	5.803
6	3 4 12.69	1.9451	12 0 29.6	8.958	6	4 39 23.71	2.0294	17 57 27.9	5.724
7	3 6 9.43	1.9462	12 9 25.4	8.902	7	4 41 25.54	2.0316	18 3 9.0	5.646
8	3 8 6.24	1.9474	12 18 17.8	8.846	8	4 43 27.50	2.0338	18 8 45.4	5.566
9	3 10 3.12	1.9486	12 27 6.9	8.790	9	4 45 29.59	2.0359	18 14 16.9	5.484
10	3 12 0.07	1.9497	12 35 52.0	8.733	10	4 47 31.81	2.0381	18 19 43.5	5.403
11	3 13 57.09	1.9510	12 44 34.9	8.675	11	4 49 34.16	2.0402	18 25 5.3	5.322
12	3 15 54.19	1.9523	12 53 13.6	8.617	12	4 51 36.64	2.0424	18 30 22.2	5.241
13	3 17 51.37	1.9537	13 1 48.9	8.558	13	4 53 39.25	2.0446	18 35 34.2	5.159
14	3 19 48.63	1.9550	13 10 20.6	8.499	14	4 55 41.99	2.0467	18 40 41.3	5.076
15	3 21 45.97	1.9564	13 18 48.8	8.439	15	4 57 44.86	2.0489	18 45 43.3	4.992
16	3 23 43.40	1.9578	13 27 13.3	8.379	16	4 59 47.86	2.0510	18 50 40.4	4.910
17	3 25 40.91	1.9592	13 35 34.3	8.319	17	5 1 50.98	2.0532	18 55 32.5	4.826
18	3 27 38.51	1.9607	13 43 51.6	8.257	18	5 3 54.24	2.0554	19 0 19.5	4.741
19	3 29 36.20	1.9622	13 52 5.2	8.196	19	5 5 57.63	2.0575	19 5 1.4	4.656
20	3 31 33.98	1.9638	14 0 15.1	8.134	20	5 8 1.14	2.0596	19 9 38.2	4.571
21	3 33 31.86	1.9654	14 8 21.3	8.071	21	5 10 4.78	2.0617	19 14 9.9	4.485
22	3 35 29.83	1.9670	14 16 23.6	8.007	22	5 12 8.55	2.0639	19 18 36.4	4.398
23	3 37 27.90	1.9687	14 24 22.2	7.945	23	5 14 12.45	2.0660	19 22 57.7	4.312
24	3 39 26.07	1.9703	N. 14 32 17.0	7.881	24	5 16 16.47	2.0681	N. 19 27 13.8	4.225

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 25.					SUNDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	5 16 16.47	2.0681	N. 19 27 13.8	4.225	0	6 57 35.72	2.1431	N. 21 2 45.2	0.355
1	5 18 20.62	2.0702	19 31 24.7	4.137	1	6 59 44.33	2.1438	21 2 20.9	0.457
2	5 20 24.89	2.0723	19 35 30.3	4.049	2	7 1 52.98	2.1446	21 1 50.4	0.558
3	5 22 29.29	2.0743	19 39 30.6	3.961	3	7 4 1.68	2.1453	21 1 13.9	0.658
4	5 24 33.81	2.0763	19 43 25.6	3.873	4	7 6 10.42	2.1459	21 0 31.4	0.760
5	5 26 38.45	2.0784	19 47 15.3	3.785	5	7 8 19.19	2.1465	20 59 42.7	0.862
6	5 28 43.22	2.0805	19 50 59.6	3.693	6	7 10 28.00	2.1472	20 58 48.0	0.962
7	5 30 48.11	2.0825	19 54 38.5	3.603	7	7 12 36.85	2.1477	20 57 47.2	1.064
8	5 32 53.12	2.0844	19 58 12.0	3.513	8	7 14 45.73	2.1482	20 56 40.3	1.165
9	5 34 58.24	2.0863	20 1 40.1	3.422	9	7 16 54.64	2.1487	20 55 27.4	1.267
10	5 37 3.48	2.0883	20 5 2.7	3.332	10	7 19 3.57	2.1491	20 54 8.3	1.368
11	5 39 8.84	2.0903	20 8 19.9	3.240	11	7 21 12.53	2.1495	20 52 43.2	1.470
12	5 41 14.32	2.0922	20 11 31.5	3.147	12	7 23 21.51	2.1498	20 51 11.9	1.572
13	5 43 19.91	2.0941	20 14 37.6	3.056	13	7 25 30.51	2.1502	20 49 34.6	1.672
14	5 45 25.61	2.0960	20 17 38.2	2.963	14	7 27 39.53	2.1504	20 47 51.2	1.774
15	5 47 31.43	2.0979	20 20 33.2	2.870	15	7 29 48.56	2.1507	20 46 1.7	1.876
16	5 49 37.36	2.0998	20 23 22.6	2.777	16	7 31 57.61	2.1508	20 44 6.1	1.977
17	5 51 43.40	2.1015	20 26 6.4	2.683	17	7 34 6.66	2.1509	20 42 4.4	2.078
18	5 53 49.54	2.1032	20 28 44.6	2.590	18	7 36 15.72	2.1511	20 39 56.7	2.179
19	5 55 55.79	2.1051	20 31 17.2	2.495	19	7 38 24.79	2.1512	20 37 42.9	2.281
20	5 58 2.15	2.1068	20 33 44.0	2.400	20	7 40 33.86	2.1512	20 35 23.0	2.382
21	6 0 8.61	2.1085	20 36 5.2	2.305	21	7 42 42.93	2.1512	20 32 57.1	2.482
22	6 2 15.17	2.1102	20 38 20.6	2.209	22	7 44 52.00	2.1512	20 30 25.1	2.584
23	6 4 21.84	2.1119	N. 20 40 30.3	2.113	23	7 47 1.07	2.1511	N. 20 27 47.0	2.684
SATURDAY 26.					MONDAY 28.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	6 6 28.60	2.1135	N. 20 42 34.2	2.017	0	7 49 10.13	2.1509	N. 20 25 3.0	2.784
1	6 8 35.46	2.1151	20 44 32.4	1.922	1	7 51 19.18	2.1507	20 22 12.9	2.885
2	6 10 42.41	2.1167	20 46 24.8	1.826	2	7 53 28.22	2.1506	20 19 16.8	2.985
3	6 12 49.46	2.1183	20 48 11.5	1.729	3	7 55 37.25	2.1503	20 16 14.7	3.086
4	6 14 56.61	2.1198	20 49 52.3	1.632	4	7 57 46.26	2.1501	20 13 6.5	3.186
5	6 17 3.84	2.1212	20 51 27.3	1.534	5	7 59 55.26	2.1498	20 9 52.4	3.285
6	6 19 11.16	2.1227	20 52 56.4	1.436	6	8 2 4.24	2.1494	20 6 32.3	3.385
7	6 21 18.56	2.1241	20 54 19.6	1.338	7	8 4 13.19	2.1490	20 3 6.2	3.485
8	6 23 26.05	2.1256	20 55 37.0	1.241	8	8 6 22.12	2.1487	19 59 34.1	3.584
9	6 25 33.63	2.1269	20 56 48.5	1.142	9	8 8 31.03	2.1482	19 55 56.1	3.682
10	6 27 41.28	2.1282	20 57 54.1	1.043	10	8 10 39.91	2.1477	19 52 12.2	3.782
11	6 29 49.01	2.1295	20 58 53.7	0.944	11	8 12 48.76	2.1472	19 48 22.3	3.881
12	6 31 56.82	2.1307	20 59 47.4	0.846	12	8 14 57.57	2.1466	19 44 26.5	3.978
13	6 34 4.70	2.1320	21 0 35.2	0.747	13	8 17 6.35	2.1461	19 40 24.9	4.076
14	6 36 12.66	2.1332	21 1 17.0	0.647	14	8 19 15.10	2.1455	19 36 17.4	4.174
15	6 38 20.69	2.1343	21 1 52.9	0.547	15	8 21 23.81	2.1448	19 32 4.0	4.272
16	6 40 28.78	2.1354	21 2 22.7	0.447	16	8 23 32.48	2.1441	19 27 44.8	4.369
17	6 42 36.94	2.1365	21 2 46.6	0.348	17	8 25 41.10	2.1433	19 23 19.7	4.466
18	6 44 45.16	2.1376	21 3 4.5	0.248	18	8 27 49.68	2.1427	19 18 48.9	4.562
19	6 46 53.45	2.1386	21 3 16.4	0.148	19	8 29 58.22	2.1419	19 14 12.2	4.659
20	6 49 1.79	2.1395	21 3 22.2	+ 0.047	20	8 32 6.71	2.1411	19 9 29.8	4.754
21	6 51 10.19	2.1405	21 3 22.0	- 0.053	21	8 34 15.15	2.1402	19 4 41.7	4.850
22	6 53 18.65	2.1414	21 3 15.8	0.154	22	8 36 23.54	2.1394	18 59 47.8	4.947
23	6 55 27.16	2.1422	21 3 3.5	0.255	23	8 38 31.88	2.1386	18 54 48.1	5.042
24	6 57 35.72	2.1431	N. 21 2 45.2	0.355	24	8 40 40.17	2.1377	N. 18 49 42.8	5.136

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 29.					THURSDAY 31.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 40 40.17	2.1377	N.18 49 42.8	5.136	0	10 21 54.20	2.0778	N.13 3 3.0	9.095
1	8 42 48.40	2.1367	18 44 31.8	5.230	1	10 23 58.83	2.0766	12 53 55.3	9.162
2	8 44 56.57	2.1357	18 39 15.2	5.323	2	10 26 3.39	2.0753	12 44 43.5	9.230
3	8 47 4.69	2.1347	18 33 53.0	5.417	3	10 28 7.87	2.0741	12 35 27.7	9.296
4	8 49 12.74	2.1337	18 28 25.2	5.510	4	10 30 12.28	2.0729	12 26 8.0	9.361
5	8 51 20.73	2.1327	18 22 51.8	5.603	5	10 32 16.62	2.0717	12 16 44.4	9.426
6	8 53 28.66	2.1317	18 17 12.8	5.695	6	10 34 20.89	2.0706	12 7 16.9	9.490
7	8 55 36.53	2.1306	18 11 28.4	5.787	7	10 36 25.09	2.0694	11 57 45.6	9.552
8	8 57 44.33	2.1294	18 5 38.4	5.878	8	10 38 29.22	2.0683	11 48 10.6	9.615
9	8 59 52.06	2.1283	17 59 43.0	5.969	9	10 40 33.29	2.0672	11 38 31.8	9.677
10	9 1 59.73	2.1272	17 53 42.1	6.060	10	10 42 37.29	2.0662	11 28 49.3	9.739
11	9 4 7.33	2.1261	17 47 35.8	6.150	11	10 44 41.23	2.0551	11 19 3.1	9.799
12	9 6 14.86	2.1249	17 41 24.1	6.240	12	10 46 45.10	2.0640	11 9 13.4	9.858
13	9 8 22.32	2.1237	17 35 7.0	6.328	13	10 48 48.91	2.0630	10 59 20.1	9.917
14	9 10 29.70	2.1224	17 28 44.7	6.417	14	10 50 52.66	2.0620	10 49 23.3	9.975
15	9 12 37.01	2.1212	17 22 17.0	6.505	15	10 52 56.35	2.0611	10 39 23.1	10.032
16	9 14 44.25	2.1201	17 15 44.0	6.593	16	10 54 59.99	2.0602	10 29 19.4	10.089
17	9 16 51.42	2.1188	17 9 5.8	6.681	17	10 57 3.57	2.0592	10 19 12.4	10.145
18	9 18 58.51	2.1175	17 2 22.3	6.767	18	10 59 7.09	2.0582	10 9 2.0	10.201
19	9 21 5.52	2.1162	16 55 33.7	6.852	19	11 1 10.56	2.0574	9 58 48.3	10.255
20	9 23 12.46	2.1150	16 48 40.0	6.938	20	11 3 13.98	2.0565	9 48 31.4	10.307
21	9 25 19.32	2.1137	16 41 41.1	7.024	21	11 5 17.35	2.0558	9 38 11.4	10.360
22	9 27 26.10	2.1123	16 34 37.1	7.108	22	11 7 20.68	2.0551	9 27 48.2	10.412
23	9 29 32.80	2.1110	N.16 27 28.1	7.192	23	11 9 23.96	2.0542	N. 9 17 21.9	10.464
WEDNESDAY 30.					FRIDAY, FEBRUARY 1.				
0	9 31 39.42	2.1097	N.16 20 14.1	7.275	0	11 11 27.19	2.0535	N. 9 6 52.5	10.514
1	9 33 45.96	2.1084	16 12 55.1	7.358	PHASES OF THE MOON.				
2	9 35 52.43	2.1071	16 5 31.1	7.442					
3	9 37 58.81	2.1057	15 58 2.1	7.523					
4	9 40 5.11	2.1043	15 50 28.3	7.603					
5	9 42 11.33	2.1030	15 42 49.7	7.684					
6	9 44 17.47	2.1017	15 35 6.2	7.764					
7	9 46 23.53	2.1003	15 27 18.0	7.843					
8	9 48 29.51	2.0989	15 19 25.0	7.923					
9	9 50 35.40	2.0975	15 11 27.3	8.001					
10	9 52 41.21	2.0962	15 3 24.9	8.078					
11	9 54 46.95	2.0949	14 55 17.9	8.155					
12	9 56 52.60	2.0935	14 47 6.3	8.231					
13	9 58 58.17	2.0922	14 38 50.2	8.307					
14	10 1 3.66	2.0908	14 30 29.5	8.382					
15	10 3 9.07	2.0895	14 22 4.4	8.456					
16	10 5 14.40	2.0882	14 13 34.8	8.530					
17	10 7 19.65	2.0868	14 5 0.8	8.603					
18	10 9 24.82	2.0855	13 56 22.4	8.676					
19	10 11 29.91	2.0842	13 47 39.7	8.747					
20	10 13 34.92	2.0828	13 38 52.8	8.817					
21	10 15 39.85	2.0816	13 30 1.6	8.888					
22	10 17 44.71	2.0803	13 21 6.2	8.957					
23	10 19 49.49	2.0791	13 12 6.7	9.027					
24	10 21 54.20	2.0778	N.13 3 3.0	9.095					

## PHASES OF THE MOON.

	d	h	m
☾ Last Quarter . . .	Jan. 7	2	47.5
● New Moon . . . . .	13	17	57.0
☾ First Quarter . . . . .	20	20	42.0
○ Full Moon . . . . .	29	1	45.1

	d	h
☾ Perigee . . . . .	Jan. 12	14.5
☾ Apogee . . . . .	24	18.1

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	Aldebaran	W.	50 26 21	2975	51 57 5	2970	53 27 55	2964	54 58 52	2958
	Spica	E.	83 46 35	3009	82 16 34	3004	80 46 26	2998	79 16 11	2993
	MARS	E.	100 24 53	3210	98 58 56	3204	97 32 52	3198	96 6 41	3192
2	Aldebaran	W.	62 35 33	2927	64 7 17	2921	65 39 9	2914	67 11 10	2907
	JUPITER	W.	35 31 15	2889	37 3 48	2882	38 36 30	2874	40 9 22	2867
	Spica	E.	71 43 15	2965	70 12 18	2959	68 41 15	2953	67 10 3	2947
	MARS	E.	88 53 51	3160	87 26 54	3153	85 59 48	3145	84 32 33	3138
	Antares	E.	117 33 58	2990	116 3 33	2983	114 32 59	2975	113 2 15	2966
3	Aldebaran	W.	74 53 36	2869	76 26 35	2861	77 59 44	2852	79 33 4	2844
	JUPITER	W.	47 56 8	2828	49 30 0	2820	51 4 2	2811	52 38 15	2802
	Pollux	W.	31 27 31	3006	32 57 36	2988	34 28 4	2970	35 58 55	2952
	Spica	E.	59 32 8	2916	58 0 9	2909	56 28 2	2903	54 55 47	2896
	MARS	E.	77 14 0	3098	75 45 49	3090	74 17 27	3082	72 48 55	3073
	Antares	E.	105 25 51	2923	103 54 2	2914	102 22 1	2905	100 49 49	2896
4	Aldebaran	W.	87 22 34	2798	88 57 5	2788	90 31 48	2778	92 6 45	2768
	JUPITER	W.	60 32 18	2756	62 7 43	2746	63 43 21	2736	65 19 12	2726
	Pollux	W.	43 38 17	2876	45 11 6	2862	46 44 13	2848	48 17 38	2835
	Spica	E.	47 12 24	2864	45 39 18	2858	44 6 5	2852	42 32 44	2847
	MARS	E.	65 23 28	3026	63 53 48	3016	62 23 55	3005	60 53 49	2995
	Antares	E.	93 5 51	2848	91 32 26	2838	89 58 49	2828	88 24 59	2818
	SUN	E.	127 22 8	3163	125 55 15	3153	124 28 9	3142	123 0 50	3131
5	Aldebaran	W.	100 4 55	2713	101 41 18	2702	103 17 55	2690	104 54 49	2678
	JUPITER	W.	73 21 59	2672	74 59 16	2660	76 36 49	2649	78 14 38	2637
	Pollux	W.	56 9 6	2767	57 44 16	2753	59 19 45	2740	60 55 32	2726
	Regulus	W.	19 59 50	2730	21 35 50	2716	23 12 8	2703	24 48 44	2689
	MARS	E.	53 20 1	2941	51 48 34	2929	50 16 52	2917	48 44 56	2905
	Antares	E.	80 32 25	2766	78 57 13	2755	77 21 46	2744	75 46 4	2732
	SUN	E.	115 40 56	3073	114 12 13	3060	112 43 14	3047	111 13 59	3034
6	JUPITER	W.	86 27 52	2574	88 7 23	2561	89 47 12	2547	91 27 20	2533
	Pollux	W.	68 59 0	2657	70 36 37	2643	72 14 34	2628	73 52 51	2614
	Regulus	W.	32 56 22	2620	34 34 50	2607	36 13 36	2593	37 52 41	2578
	MARS	E.	41 1 26	2845	39 27 57	2833	37 54 13	2821	36 20 13	2810
	Antares	E.	67 43 44	2674	66 6 29	2663	64 28 59	2651	62 51 13	2639
	SUN	E.	103 43 33	2964	102 12 35	2950	100 41 19	2935	99 9 44	2920
7	JUPITER	W.	99 52 46	2464	101 34 50	2449	103 17 15	2435	105 0 0	2420
	Pollux	W.	82 9 12	2540	83 49 29	2525	85 30 7	2510	87 11 6	2495
	Regulus	W.	46 13 4	2505	47 54 10	2490	49 35 36	2475	51 17 24	2460
	Antares	E.	54 38 24	2581	52 59 3	2570	51 19 27	2560	49 39 37	2550
	SUN	E.	91 27 1	2843	89 53 29	2827	88 19 36	2811	86 45 22	2795
8	Pollux	W.	95 41 14	2421	97 24 19	2406	99 7 45	2391	100 51 33	2377
	Regulus	W.	59 51 42	2384	61 35 39	2370	63 19 57	2355	65 4 37	2339
	SUN	E.	78 48 54	2713	77 12 31	2697	75 35 47	2681	73 58 41	2664
9	Regulus	W.	73 53 29	2264	75 40 21	2250	77 27 34	2236	79 15 8	2222
	SUN	E.	65 47 42	2584	64 8 25	2569	62 28 48	2553	60 48 49	2538



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Aldebaran W.	56 29 57	2952	58 1 9	2946	59 32 29	2940	61 3 57	2934
	Spica E.	77 45 50	2988	76 15 22	2982	74 44 47	2976	73 14 5	2970
	MARS E.	94 40 22	3186	93 13 56	3179	91 47 22	3173	90 20 40	3167
2	Aldebaran W.	68 43 21	2900	70 15 40	2892	71 48 9	2884	73 20 47	2876
	JUPITER W.	41 42 23	2859	43 15 34	2852	44 48 55	2844	46 22 26	2835
	Spica E.	65 38 44	2941	64 7 17	2935	62 35 42	2928	61 3 59	2922
	MARS E.	83 5 9	3130	81 37 36	3122	80 9 54	3114	78 42 2	3106
	Antares E.	111 31 20	2958	110 0 14	2949	108 28 57	2940	106 57 29	2932
3	Aldebaran W.	81 6 35	2835	82 40 17	2826	84 14 10	2817	85 48 16	2808
	JUPITER W.	54 12 40	2793	55 47 17	2784	57 22 5	2775	58 57 5	2766
	Pollux W.	37 30 8	2936	39 1 41	2920	40 33 34	2905	42 5 46	2891
	Spica E.	53 23 23	2890	51 50 51	2883	50 18 10	2876	48 45 21	2870
	MARS E.	71 20 12	3064	69 51 18	3055	68 22 13	3045	66 52 56	3036
	Antares E.	99 17 25	2887	97 44 50	2878	96 12 3	2868	94 39 3	2858
4	Aldebaran W.	93 41 55	2758	95 17 18	2747	96 52 56	2736	98 28 48	2725
	JUPITER W.	66 55 17	2716	68 31 36	2705	70 8 9	2694	71 44 57	2683
	Pollux W.	49 51 20	2821	51 25 20	2808	52 59 38	2795	54 34 13	2781
	Spica E.	40 59 17	2842	39 25 43	2836	37 52 2	2832	36 18 16	2828
	MARS E.	59 23 30	2985	57 52 58	2974	56 22 13	2963	54 51 14	2952
	Antares E.	86 50 55	2808	85 16 38	2798	83 42 8	2787	82 7 24	2776
	SUN E.	121 33 19	3120	120 5 34	3109	118 37 36	3097	117 9 23	3085
5	Aldebaran W.	106 31 59	2665	108 9 26	2653	109 47 9	2640	111 25 9	2627
	JUPITER W.	79 52 43	2624	81 31 5	2612	83 9 43	2599	84 48 39	2587
	Pollux W.	62 31 37	2713	64 8 0	2699	65 44 41	2685	67 21 41	2671
	Regulus W.	26 25 39	2675	28 2 52	2662	29 40 23	2648	31 18 13	2634
	MARS E.	47 12 44	2894	45 40 17	2882	44 7 36	2870	42 34 39	2858
	Antares E.	74 10 7	2721	72 33 55	2709	70 57 27	2697	69 20 43	2686
	SUN E.	109 44 28	3020	108 14 40	3006	106 44 35	2992	105 14 13	2978
6	JUPITER W.	93 7 47	2520	94 48 33	2506	96 29 38	2492	98 11 2	2478
	Pollux W.	75 31 27	2599	77 10 23	2585	78 49 39	2570	80 29 15	2555
	Regulus W.	39 32 6	2564	41 11 51	2550	42 51 55	2535	44 32 19	2520
	MARS E.	34 45 58	2798	33 11 28	2786	31 36 42	2775	30 1 42	2763
	Antares E.	61 13 11	2627	59 34 53	2615	57 56 19	2604	56 17 29	2593
	SUN E.	97 37 51	2905	96 5 38	2890	94 33 6	2874	93 0 14	2858
7	JUPITER W.	106 43 6	2405	108 26 33	2390	110 10 21	2375	111 54 31	2361
	Pollux W.	88 52 25	2480	90 34 6	2465	92 16 7	2450	93 58 30	2436
	Regulus W.	52 59 32	2445	54 42 2	2430	56 24 54	2415	58 8 7	2400
	Antares E.	47 59 32	2540	46 19 14	2531	44 38 43	2522	42 58 0	2512
	SUN E.	85 10 47	2779	83 35 51	2763	82 0 34	2746	80 24 55	2729
8	Pollux W.	102 35 41	2362	104 20 10	2348	106 5 0	2334	107 50 10	2320
	Regulus W.	66 49 40	2324	68 35 5	2309	70 20 51	2294	72 6 59	2279
	SUN E.	72 21 13	2648	70 43 23	2632	69 5 11	2616	67 26 37	2600
9	Regulus W.	81 3 3	2208	82 51 18	2195	84 39 54	2182	86 28 49	2169
	SUN E.	59 8 29	2524	57 27 49	2509	55 46 48	2494	54 5 27	2481

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
10	Regulus	W.	88 18 4	2156	90 7 38	2143	91 57 31	2132	93 47 41	2121
	SUN	E.	52 23 47	2467	50 41 48	2454	48 59 30	2442	47 16 55	2429
11	Regulus	W.	103 2 40	2071	104 54 24	2063	106 46 20	2055	108 38 29	2048
	SUN	E.	38 39 52	2377	36 55 43	2368	35 11 22	2359	33 26 49	2351
16	SUN	W.	30 45 1	2583	32 24 19	2601	34 3 12	2620	35 41 40	2639
	Aldebaran	E.	102 18 20	2262	100 31 24	2279	98 44 54	2297	96 58 50	2314
17	SUN	W.	43 47 31	2737	45 23 22	2757	46 58 47	2777	48 33 45	2797
	Aldebaran	E.	88 14 56	2405	86 31 29	2424	84 48 29	2443	83 5 55	2461
	JUPITER	E.	113 27 52	2373	111 43 39	2391	109 59 52	2410	108 16 32	2429
18	SUN	W.	56 21 59	2899	57 54 19	2919	59 26 13	2939	60 57 42	2959
	Aldebaran	E.	74 39 42	2556	72 59 47	2574	71 20 17	2593	69 41 13	2612
	JUPITER	E.	99 46 29	2523	98 5 48	2541	96 25 32	2559	94 45 41	2578
	Pollux	E.	118 39 32	2604	117 0 42	2622	115 22 17	2639	113 44 15	2656
19	SUN	W.	68 28 56	3056	69 57 59	3074	71 26 40	3093	72 54 58	3111
	SATURN	W.	24 47 21	2748	26 23 5	2759	27 58 27	2775	29 33 28	2791
	Aldebaran	E.	61 32 3	2701	59 55 25	2718	58 19 10	2735	56 43 17	2752
	JUPITER	E.	86 32 42	2667	84 55 18	2685	83 18 18	2701	81 41 40	2718
	Pollux	E.	105 39 52	2742	104 4 8	2758	102 28 45	2774	100 53 43	2790
20	SUN	W.	80 11 7	3197	81 37 20	3212	83 3 15	3227	84 28 51	3242
	Fomalhaut	W.	48 9 6	3249	49 34 17	3245	50 59 33	3242	52 24 53	3240
	SATURN	W.	37 23 21	2869	38 56 20	2883	40 29 1	2897	42 1 24	2911
	Aldebaran	E.	48 49 17	2831	47 15 30	2845	45 42 1	2859	44 8 51	2873
	JUPITER	E.	73 43 53	2797	72 9 21	2811	70 35 8	2825	69 1 13	2839
	Pollux	E.	93 3 48	2868	91 30 48	2883	89 58 7	2897	88 25 44	2910
21	SUN	W.	91 32 40	3311	92 56 39	3323	94 20 23	3335	95 43 54	3346
	Fomalhaut	W.	59 31 44	3243	60 57 2	3245	62 22 17	3247	63 47 30	3250
	SATURN	W.	49 39 6	2973	51 9 52	2985	52 40 24	2996	54 10 42	3006
	α Pegasi	W.	46 12 25	3698	47 29 14	3674	48 46 29	3652	50 4 8	3632
	Aldebaran	E.	36 27 16	2937	34 55 45	2949	33 24 28	2960	31 53 25	2970
	JUPITER	E.	61 15 58	2903	59 43 43	2914	58 11 42	2925	56 39 55	2936
	Pollux	E.	80 48 2	2974	79 17 18	2986	77 46 48	2997	76 16 32	3008
	Regulus	E.	116 35 38	2938	115 4 7	2949	113 32 50	2959	112 1 47	2969
22	SUN	W.	102 38 27	3395	104 0 49	3403	105 23 1	3411	106 45 5	3418
	Fomalhaut	W.	70 52 41	3267	72 17 31	3270	73 42 17	3273	75 6 59	3276
	SATURN	W.	61 39 11	3052	63 8 20	3059	64 37 20	3066	66 6 11	3073
	α Pegasi	W.	56 37 2	3560	57 56 20	3550	59 15 49	3541	60 35 28	3532
	JUPITER	E.	49 4 12	2982	47 33 37	2990	46 3 12	2998	44 32 57	3005
	Pollux	E.	68 48 23	3057	67 19 21	3065	65 50 29	3073	64 21 47	3082
	Regulus	E.	104 29 31	3014	102 59 36	3022	101 29 51	3029	100 0 14	3035
23	SUN	W.	113 33 33	3447	114 54 56	3451	116 16 14	3455	117 37 28	3459
	Fomalhaut	W.	82 9 36	3292	83 33 57	3294	84 58 15	3297	86 22 30	3299
	SATURN	W.	73 28 35	3100	74 56 45	3104	76 24 50	3107	77 52 51	3110
	α Pegasi	W.	67 15 46	3501	68 36 9	3496	69 56 38	3491	71 17 12	3487

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
10	Regulus	W.	95 38 9	2110	97 28 53	2099	99 19 54	2089	101 11 10	2080
	SUN	E.	45 34 2	2417	43 50 52	2407	42 7 27	2396	40 23 47	2386
11	Regulus	W.	110 30 49	2041	112 23 19	2035	114 15 59	2030	116 8 47	2026
	SUN	E.	31 42 4	2344	29 57 9	2338	28 12 6	2333	26 26 55	2328
16	SUN	W.	37 19 42	2658	38 57 18	2677	40 34 29	2697	42 11 13	2717
	Aldebaran	E.	95 13 11	2332	93 27 58	2350	91 43 11	2368	89 58 50	2387
17	SUN	W.	50 8 17	2818	51 42 22	2838	53 16 1	2859	54 49 13	2879
	Aldebaran	E.	81 23 47	2480	79 42 6	2499	78 0 52	2518	76 20 4	2537
	JUPITER	E.	106 33 38	2448	104 51 11	2467	103 9 11	2485	101 27 37	2504
18	SUN	W.	62 28 46	2979	63 59 25	2999	65 29 39	3018	66 59 29	3037
	Aldebaran	E.	68 2 34	2630	66 24 20	2648	64 46 30	2666	63 9 5	2684
	JUPITER	E.	93 6 16	2596	91 27 16	2614	89 48 41	2632	88 10 30	2649
	Pollux	E.	112 6 36	2674	110 29 21	2691	108 52 29	2707	107 15 59	2725
19	SUN	W.	74 22 54	3129	75 50 29	3147	77 17 42	3164	78 44 34	3180
	SATURN	W.	31 8 8	2807	32 42 27	2823	34 16 25	2838	35 50 3	2854
	Aldebaran	E.	55 7 47	2769	53 32 39	2785	51 57 51	2801	50 23 24	2816
	JUPITER	E.	80 5 24	2734	78 29 30	2750	76 53 57	2766	75 18 45	2782
	Pollux	E.	99 19 3	2806	97 44 43	2822	96 10 45	2838	94 37 7	2853
20	SUN	W.	85 54 10	3257	87 19 12	3271	88 43 57	3285	90 8 26	3298
	Fomalhaut	W.	53 50 15	3239	55 15 38	3239	56 41 1	3240	58 6 23	3241
	SATURN	W.	43 33 29	2924	45 5 17	2937	46 36 49	2950	48 8 5	2962
	Aldebaran	E.	42 35 58	2887	41 3 23	2901	39 31 5	2913	37 59 3	2925
	JUPITER	E.	67 27 36	2852	65 54 16	2866	64 21 14	2879	62 48 28	2891
	Pollux	E.	86 53 38	2924	85 21 50	2937	83 50 18	2950	82 19 2	2963
21	SUN	W.	97 7 12	3357	98 30 18	3367	99 53 12	3377	101 15 55	3386
	Fomalhaut	W.	65 12 40	3253	66 37 46	3257	68 2 48	3260	69 27 46	3263
	SATURN	W.	55 40 47	3016	57 10 40	3025	58 40 21	3034	60 9 51	3043
	$\alpha$ Pegasi	W.	51 22 8	3614	52 40 27	3598	53 59 4	3584	55 17 56	3571
	Aldebaran	E.	30 22 35	2980	28 51 58	2990	27 21 33	3000	25 51 20	3009
	JUPITER	E.	55 8 22	2946	53 37 2	2956	52 5 54	2965	50 34 58	2973
	Pollux	E.	74 46 29	3018	73 16 39	3029	71 47 2	3039	70 17 37	3048
	Regulus	E.	110 30 56	2979	109 0 18	2989	107 29 51	2998	105 59 36	3006
22	SUN	W.	108 7 1	3425	109 28 49	3431	110 50 30	3437	112 12 4	3442
	Fomalhaut	W.	76 31 38	3280	77 56 13	3283	79 20 44	3286	80 45 12	3289
	SATURN	W.	67 34 54	3079	69 3 29	3085	70 31 57	3090	72 0 19	3095
	$\alpha$ Pegasi	W.	61 55 17	3525	63 15 14	3519	64 35 17	3512	65 55 28	3506
	JUPITER	E.	43 2 51	3013	41 32 54	3019	40 3 4	3025	38 33 22	3030
	Pollux	E.	62 53 15	3089	61 24 52	3096	59 56 38	3103	58 28 32	3110
	Regulus	E.	98 30 45	3042	97 1 24	3048	95 32 11	3053	94 3 4	3058
23	SUN	W.	118 58 38	3462	120 19 45	3464	121 40 49	3466	123 1 51	3468
	Fomalhaut	W.	87 46 43	3301	89 10 53	3303	90 35 0	3305	91 59 6	3307
	SATURN	W.	79 20 48	3113	80 48 42	3115	82 16 33	3117	83 44 22	3119
	$\alpha$ Pegasi	W.	72 37 50	3183	73 58 33	3479	75 19 20	3475	76 40 12	3472

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
23	JUPITER E.	37 3 47	3035	35 34 18	3041	34 4 56	3045	32 35 39	3050
	Pollux E.	57 0 34	3116	55 32 43	3122	54 5 0	3128	52 37 24	3133
	Regulus E.	92 34 3	3062	91 5 7	3066	89 36 16	3069	88 7 29	3073
24	Fomalhaut W.	93 23 9	3309	94 47 10	3311	96 11 9	3312	97 35 7	3313
	SATURN W.	85 12 9	3120	86 39 55	3121	88 7 39	3121	89 35 23	3120
	α Pegasi W.	78 1 7	3469	79 22 6	3466	80 43 8	3463	82 4 13	3460
	α Arietis W.	34 28 45	3588	35 47 32	3584	37 6 57	3583	38 26 56	3496
	Pollux E.	45 20 59	3158	43 54 0	3163	42 27 7	3168	41 0 20	3174
	Regulus E.	80 44 23	3082	79 15 51	3083	77 47 21	3082	76 18 50	3082
25	Fomalhaut W.	104 34 30	3320	105 58 18	3322	107 22 4	3323	108 45 49	3325
	SATURN W.	96 54 16	3114	98 22 8	3112	99 50 2	3110	101 18 0	3107
	α Pegasi W.	88 50 27	3448	90 11 50	3446	91 33 15	3443	92 54 43	3441
	α Arietis W.	45 13 47	3588	46 36 18	3570	47 59 9	3584	49 22 18	3538
	Regulus E.	68 56 7	3078	67 27 30	3075	65 58 50	3072	64 30 7	3069
26	SATURN W.	108 38 44	3089	110 7 7	3085	111 35 35	3080	113 4 9	3075
	α Pegasi W.	99 42 28	3435	101 4 5	3435	102 25 42	3434	103 47 20	3435
	α Arietis W.	56 22 12	3273	57 46 55	3261	59 11 52	3250	60 37 2	3239
	Aldebaran W.	23 7 40	3055	24 36 45	3049	26 5 57	3043	27 35 16	3038
	Regulus E.	57 5 32	3052	55 36 23	3047	54 7 9	3043	52 37 49	3039
	Spica E.	110 52 57	3087	109 24 32	3083	107 56 2	3078	106 27 25	3073
27	α Arietis W.	67 46 3	3188	69 12 27	3178	70 39 2	3168	72 5 49	3159
	Aldebaran W.	35 3 31	3009	36 33 32	3003	38 3 41	2997	39 33 58	2990
	Regulus E.	45 9 39	3011	43 39 40	3006	42 9 35	3000	40 39 22	2993
	Spica E.	99 2 37	3043	97 33 17	3036	96 3 49	3030	94 34 13	3023
28	α Arietis W.	79 22 28	3114	80 50 20	3106	82 18 22	3098	83 46 34	3090
	Aldebaran W.	47 7 28	2956	48 38 36	2949	50 9 53	2942	51 41 19	2934
	JUPITER W.	23 8 43	2950	24 39 58	2940	26 11 26	2931	27 43 6	2922
	Regulus E.	33 6 20	2962	31 35 20	2956	30 4 12	2950	28 32 56	2943
	Spica E.	87 4 10	2989	85 33 44	2982	84 3 9	2975	82 32 25	2969
29	α Arietis W.	91 10 3	3051	92 39 13	3043	94 8 32	3036	95 38 0	3029
	Aldebaran W.	59 20 52	2896	60 53 15	2888	62 25 49	2880	63 58 33	2873
	JUPITER W.	35 24 17	2878	36 57 4	2869	38 30 2	2861	40 3 11	2853
	Spica E.	74 56 24	2933	73 24 57	2926	71 53 11	2919	70 21 15	2912
30	α Arietis W.	103 7 24	2998	104 37 40	2992	106 8 3	2986	107 38 33	2981
	Aldebaran W.	71 44 43	2833	73 18 28	2825	74 52 23	2817	76 26 29	2809
	JUPITER W.	47 51 36	2811	49 25 49	2803	51 0 13	2795	52 34 48	2787
	Pollux W.	28 25 11	2998	29 55 26	2977	31 26 8	2966	32 57 17	2956
	Spica E.	62 39 26	2877	61 6 38	2870	59 33 41	2864	58 0 36	2858
	MARS E.	96 32 11	3052	95 3 3	3044	93 33 45	3035	92 4 16	3027
31	Aldebaran W.	84 19 35	2769	85 54 44	2760	87 30 4	2752	89 5 35	2744
	JUPITER W.	60 30 20	2746	62 5 59	2738	63 41 49	2729	65 17 50	2721
	Pollux W.	40 38 38	2856	42 11 53	2843	43 45 25	2830	45 19 14	2818
	Spica E.	50 13 13	2828	48 39 22	2823	47 5 24	2818	45 31 20	2814
	MARS E.	84 34 14	2985	83 3 42	2976	81 32 59	2967	80 2 5	2958

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
23	JUPITER E.	31 6 28	3034	29 37 22	3058	28 8 22	3062	26 39 26	3066
	Pollux E.	51 9 54	3138	49 42 31	3143	48 15 14	3148	46 48 4	3153
	Regulus E.	86 38 46	3076	85 10 7	3078	83 41 30	3080	82 12 56	3081
24	Fomalhaut W.	98 59 3	3315	100 22 57	3316	101 46 50	3318	103 10 41	3319
	SATURN W.	91 3 8	3120	92 30 53	3119	93 58 39	3118	95 26 27	3116
	α Pegasi W.	83 25 22	3457	84 46 34	3454	86 7 49	3452	87 29 7	3450
	α Arietis W.	39 47 25	3470	41 8 23	3446	42 29 48	3425	43 51 37	3406
	Pollux E.	39 33 40	3179	38 7 6	3185	36 40 39	3192	35 14 20	3198
	Regulus E.	74 50 19	3082	73 21 48	3081	71 53 16	3080	70 24 42	3079
25	Fomalhaut W.	110 9 31	3327	111 33 11	3329	112 56 48	3331	114 20 23	3333
	SATURN W.	102 46 1	3104	104 14 6	3101	105 42 14	3097	107 10 27	3094
	α Pegasi W.	94 16 13	3439	95 37 45	3438	96 59 18	3437	98 20 52	3436
	α Arietis W.	50 45 45	3324	52 9 29	3311	53 33 28	3298	54 57 43	3285
	Regulus E.	63 1 20	3066	61 32 30	3063	60 3 35	3060	58 34 36	3056
26	SATURN W.	114 32 49	3070	116 1 35	3065	117 30 28	3059	118 59 28	3054
	α Pegasi W.	105 8 57	3436	106 30 33	3437	107 52 9	3438	109 13 43	3439
	α Arietis W.	62 2 26	3228	63 28 2	3218	64 53 50	3208	66 19 51	3198
	Aldebaran W.	29 4 41	3033	30 34 13	3027	32 3 52	3022	33 33 38	3016
	Regulus E.	51 8 24	3034	49 38 53	3028	48 9 15	3022	46 39 30	3017
	Spica E.	104 58 42	3067	103 29 51	3061	102 0 54	3055	100 31 49	3049
27	α Arietis W.	73 32 47	3150	74 59 56	3141	76 27 16	3132	77 54 47	3123
	Aldebaran W.	41 4 23	2984	42 34 56	2977	44 5 38	2970	45 36 29	2963
	Regulus E.	39 9 1	2987	37 38 32	2981	36 7 56	2975	34 37 12	2969
	Spica E.	93 4 29	3017	91 34 37	3010	90 4 37	3003	88 34 28	2996
28	α Arietis W.	85 14 57	3082	86 43 29	3074	88 12 11	3066	89 41 2	3058
	Aldebaran W.	53 12 55	2927	54 44 40	2920	56 16 34	2912	57 48 38	2904
	JUPITER W.	29 14 57	2913	30 47 0	2904	32 19 14	2895	33 51 40	2886
	Regulus E.	27 1 32	2937	25 30 0	2931	23 58 21	2925	22 26 34	2919
	Spica E.	81 1 33	2962	79 30 32	2954	77 59 22	2947	76 28 2	2940
29	α Arietis W.	97 7 37	3022	98 37 22	3016	100 7 15	3010	101 37 16	3004
	Aldebaran W.	65 31 27	2865	67 4 31	2857	68 37 45	2849	70 11 9	2841
	JUPITER W.	41 36 30	2845	43 10 0	2836	44 43 41	2828	46 17 33	2819
	Spica E.	68 49 11	2905	67 16 58	2898	65 44 36	2891	64 12 5	2884
30	α Arietis W.	109 9 9	2977	110 39 51	2973	112 10 38	2969	113 41 30	2964
	Aldebaran W.	78 0 45	2801	79 35 11	2793	81 9 48	2785	82 44 36	2777
	JUPITER W.	54 9 33	2779	55 44 29	2771	57 19 35	2763	58 54 52	2754
	Pollux W.	34 28 51	2918	36 0 47	2902	37 33 4	2886	39 5 41	2871
	Spica E.	56 27 23	2852	54 54 2	2846	53 20 33	2840	51 46 57	2833
	MARS E.	90 34 37	3018	89 4 47	3010	87 34 47	3001	86 4 36	2993
31	Aldebaran W.	90 41 17	2736	92 17 10	2728	93 53 13	2719	95 29 27	2710
	JUPITER W.	66 54 1	2713	68 30 23	2705	70 6 56	2697	71 43 40	2689
	Pollux W.	46 53 19	2806	48 27 39	2794	50 2 15	2783	51 37 6	2772
	Spica E.	43 57 10	2810	42 22 55	2807	40 48 36	2804	39 14 13	2801
	MARS E.	78 31 0	2950	76 59 45	2941	75 28 19	2932	73 56 41	2924

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.				
		h m s	s	° ' "	"	' "	s	m s	s	
Frid.	1	20 55 51.45	10.215	S. 17 20 20.9	+ 42.04	16 15.72	68.33	13 38.91	0.358	
Sat.	2	20 59 56.21	10.181	17 3 22.6	42.81	16 15.57	68.22	13 47.10	0.324	
SUN.	3	21 4 0.17	10.147	16 46 6.3	43.55	16 15.42	68.10	13 54.49	0.291	
Mon.	4	21 8 3.32	10.114	16 28 32.4	+ 44.27	16 15.26	67.99	14 1.07	0.258	
Tues.	5	21 12 5.68	10.081	16 10 41.4	44.97	16 15.10	67.88	14 6.86	0.225	
Wed.	6	21 16 7.25	10.048	15 52 33.6	45.66	16 14.93	67.76	14 11.85	0.192	
Thur.	7	21 20 8.01	10.015	15 34 9.5	+ 46.34	16 14.76	67.64	14 16.05	0.159	
Frid.	8	21 24 8.00	9.983	15 15 29.3	47.00	16 14.58	67.52	14 19.48	0.126	
Sat.	9	21 28 7.20	9.950	14 56 33.6	47.64	16 14.40	67.41	14 22.12	0.094	
SUN.	10	21 32 5.62	9.918	14 37 22.7	+ 48.26	16 14.22	67.30	14 23.98	0.061	
Mon.	11	21 36 3.27	9.886	14 17 57.2	48.86	16 14.03	67.19	14 25.06	0.029	
Tues.	12	21 40 0.13	9.854	13 58 17.3	49.44	16 13.84	67.08	14 25.37	0.003	
Wed.	13	21 43 56.23	9.821	13 38 23.7	+ 50.01	16 13.65	66.97	14 24.92	0.035	
Thur.	14	21 47 51.57	9.790	13 18 16.6	50.56	16 13.46	66.86	14 23.70	0.066	
Frid.	15	21 51 46.14	9.759	12 57 56.6	51.10	16 13.27	66.76	14 21.72	0.098	
Sat.	16	21 55 39.97	9.728	12 37 24.0	+ 51.61	16 13.08	66.66	14 19.01	0.129	
SUN.	17	21 59 33.05	9.697	12 16 39.3	52.10	16 12.88	66.56	14 15.55	0.159	
Mon.	18	22 3 25.40	9.667	11 55 42.9	52.58	16 12.68	66.46	14 11.36	0.189	
Tues.	19	22 7 17.04	9.637	11 34 35.3	+ 53.04	16 12.48	66.36	14 6.46	0.219	
Wed.	20	22 11 7.97	9.608	11 13 16.8	53.49	16 12.27	66.26	14 0.85	0.248	
Thur.	21	22 14 58.21	9.579	10 51 47.9	53.91	16 12.06	66.16	13 54.55	0.276	
Frid.	22	22 18 47.78	9.551	10 30 9.1	+ 54.32	16 11.85	66.07	13 47.58	0.304	
Sat.	23	22 22 36.68	9.524	10 8 20.6	54.71	16 11.63	65.98	13 39.95	0.331	
SUN.	24	22 26 24.94	9.497	9 46 22.9	55.09	16 11.41	65.89	13 31.69	0.358	
Mon.	25	22 30 12.58	9.472	9 24 16.4	+ 55.44	16 11.18	65.80	13 22.80	0.383	
Tues.	26	22 33 59.62	9.448	9 2 1.6	55.79	16 10.95	65.71	13 13.31	0.408	
Wed.	27	22 37 46.07	9.424	8 39 38.7	56.12	16 10.72	65.63	13 3.24	0.431	
Thur.	28	22 41 31.96	9.401	8 17 8.2	56.43	16 10.48	65.55	12 52.60	0.454	
Frid.	29	22 45 17.31	9.379	S. 7 54 30.4	+ 56.72	16 10.24	65.47	12 41.42	0.476	

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0<sup>s</sup>.18 from the sidereal time.  
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
Frid.	1	<sup>h</sup> 20 <sup>m</sup> 55 <sup>s</sup> 49.12	<sup>s</sup> 10.215	<sup>°</sup> S. 17 <sup>'</sup> 20 <sup>"</sup> 30.6	<sup>"</sup> +42.03	<sup>m</sup> 13 <sup>s</sup> 38.83	<sup>s</sup> 0.358	<sup>h</sup> 20 <sup>m</sup> 42 <sup>s</sup> 10.29
Sat.	2	20 59 53.87	10.181	17 3 32.6	42.80	13 47.03	0.324	20 46 6.84
SUN.	3	21 3 57.82	10.147	16 46 16.5	43.54	13 54.42	0.291	20 50 3.40
Mon.	4	21 8 0.96	10.114	16 28 42.9	+44.27	14 1.01	0.258	20 53 59.95
Tues.	5	21 12 3.31	10.081	16 10 52.1	44.98	14 6.81	0.225	20 57 56.50
Wed.	6	21 16 4.87	10.048	15 52 44.5	45.67	14 11.81	0.192	21 1 53.06
Thur.	7	21 20 5.63	10.015	15 34 20.6	+46.34	14 16.01	0.159	21 5 49.62
Frid.	8	21 24 5.62	9.983	15 15 40.6	46.99	14 19.45	0.126	21 9 46.17
Sat.	9	21 28 4.82	9.950	14 56 45.1	47.63	14 22.10	0.094	21 13 42.72
SUN.	10	21 32 3.24	9.918	14 37 34.4	+48.25	14 23.96	0.061	21 17 39.28
Mon.	11	21 36 0.89	9.886	14 18 9.0	48.86	14 25.06	0.029	21 21 35.83
Tues.	12	21 39 57.76	9.854	13 58 29.3	49.44	14 25.37	0.003	21 25 32.39
Wed.	13	21 43 53.87	9.821	13 38 35.8	+50.01	14 24.93	0.035	21 29 28.94
Thur.	14	21 47 49.22	9.790	13 18 28.8	50.56	14 23.72	0.066	21 33 25.50
Frid.	15	21 51 43.80	9.759	12 58 8.9	51.09	14 21.75	0.098	21 37 22.05
Sat.	16	21 55 37.65	9.728	12 37 36.4	+51.61	14 19.05	0.129	21 41 18.60
SUN.	17	21 59 30.75	9.698	12 16 51.8	52.10	14 15.59	0.158	21 45 15.16
Mon.	18	22 3 23.12	9.668	11 55 55.4	52.58	14 11.41	0.189	21 49 11.71
Tues.	19	22 7 14.78	9.638	11 34 47.9	+53.04	14 6.51	0.219	21 53 8.27
Wed.	20	22 11 5.73	9.609	11 13 29.4	53.49	14 0.91	0.248	21 57 4.82
Thur.	21	22 14 55.99	9.580	10 52 0.5	53.91	13 54.62	0.276	22 1 1.37
Frid.	22	22 18 45.58	9.552	10 30 21.6	+54.32	13 47.65	0.304	22 4 57.93
Sat.	23	22 22 34.51	9.525	10 8 33.1	54.71	13 40.03	0.331	22 8 54.48
SUN.	24	22 26 22.80	9.498	9 46 35.4	55.08	13 31.77	0.358	22 12 51.03
Mon.	25	22 30 10.47	9.473	9 24 28.9	+55.44	13 22.88	0.383	22 16 47.59
Tues.	26	22 33 57.54	9.449	9 2 14.0	55.79	13 13.40	0.408	22 20 44.14
Wed.	27	22 37 44.02	9.425	8 39 51.0	56.12	13 3.33	0.431	22 24 40.69
Thur.	28	22 41 29.94	9.402	8 17 20.4	56.43	12 52.70	0.454	22 28 37.24
Frid.	29	22 45 15.32	9.380	S. 7 54 42.5	+56.72	12 41.52	0.476	22 32 33.80

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,  
+ 9<sup>s</sup>.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
		° ' "	' "	"	"			h m s
1	32	311 29 58.1	30 7.3	152.18	+ 0.75	9.993 6214	+ 27.3	3 17 17.30
2	33	312 30 50.0	30 59.1	152.14	0.84	9.993 6881	28.3	3 13 21.40
3	34	313 31 41.0	31 49.9	152.10	0.90	9.993 7571	29.2	3 9 25.49
4	35	314 32 31.1	32 39.8	152.07	+ 0.92	9.993 8283	+ 30.1	3 5 29.58
5	36	315 33 20.3	33 28.9	152.03	0.92	9.993 9016	30.9	3 1 33.67
6	37	316 34 8.6	34 17.1	151.99	0.88	9.993 9768	31.7	2 57 37.76
7	38	317 34 56.0	35 4.4	151.95	+ 0.81	9.994 0538	+ 32.4	2 53 41.85
8	39	318 35 42.5	35 50.7	151.91	0.71	9.994 1324	33.0	2 49 45.94
9	40	319 36 27.9	36 36.0	151.87	0.59	9.994 2123	33.6	2 45 50.03
10	41	320 37 12.2	37 20.2	151.82	+ 0.44	9.994 2936	+ 34.1	2 41 54.12
11	42	321 37 55.3	38 3.2	151.77	0.31	9.994 3760	34.6	2 37 58.22
12	43	322 38 37.1	38 44.9	151.72	0.18	9.994 4594	35.0	2 34 2.31
13	44	323 39 17.6	39 25.2	151.66	+ 0.04	9.994 5438	+ 35.4	2 30 6.40
14	45	324 39 56.6	40 4.1	151.59	- 0.06	9.994 6292	35.8	2 26 10.49
15	46	325 40 34.0	40 41.4	151.52	0.15	9.994 7156	36.2	2 22 14.58
16	47	326 41 9.7	41 17.0	151.45	- 0.21	9.994 8031	+ 36.7	2 18 18.68
17	48	327 41 43.7	41 50.9	151.38	0.23	9.994 8917	37.2	2 14 22.77
18	49	328 42 16.0	42 23.1	151.31	0.23	9.994 9816	37.7	2 10 26.86
19	50	329 42 46.4	42 53.4	151.23	- 0.22	9.995 0728	+ 38.3	2 6 30.95
20	51	330 43 15.0	43 21.8	151.15	0.17	9.995 1654	38.9	2 2 35.04
21	52	331 43 41.7	43 48.4	151.08	- 0.09	9.995 2594	39.5	1 58 39.14
22	53	332 44 6.5	44 13.1	151.00	+ 0.01	9.995 3550	+ 40.2	1 54 43.23
23	54	333 44 29.4	44 35.9	150.92	0.12	9.995 4522	40.8	1 50 47.32
24	55	334 44 50.4	44 56.8	150.84	0.25	9.995 5511	41.5	1 46 51.41
25	56	335 45 9.5	45 15.9	150.76	+ 0.39	9.995 6516	+ 42.2	1 42 55.51
26	57	336 45 26.8	45 33.1	150.68	0.52	9.995 7539	43.0	1 38 59.60
27	58	337 45 42.3	45 48.5	150.60	0.63	9.995 8579	43.7	1 35 3.69
28	59	338 45 56.0	46 2.0	150.53	+ 0.74	9.995 9637	+ 44.5	1 31 7.79
29	60	339 46 7.8	46 13.8	150.46	+ 0.83	9.996 0713	+ 45.2	1 27 11.88
NOTE.—The longitudes in the column $\lambda$ are referred to the true equinox of their own date, while those in the column $\lambda'$ are referred to the mean equinox of the beginning of the Besselian fictitious year.								Diff. for 1 Hour, — 9 <sup>s</sup> .8296. (Table II.)



## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.									
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
1	15 22.7	15 26.7	56 20.4	+ 1.22	56 35.2	+ 1.25	h m 14 57.5	m 1.95	d 18.3
2	15 30.9	15 35.1	56 50.5	1.28	57 6.0	1.31	15 44.2	1.96	19.3
3	15 39.4	15 43.9	57 21.9	1.34	57 38.1	1.36	16 31.6	2.00	20.3
4	15 48.3	15 52.8	57 54.5	+ 1.38	58 11.1	+ 1.38	17 20.4	2.08	21.3
5	15 57.4	16 1.8	58 27.7	1.36	58 44.1	1.34	18 11.7	2.20	22.3
6	16 6.2	16 10.3	59 0.1	1.30	59 15.4	1.23	19 5.9	2.33	23.3
7	16 14.2	16 17.7	59 29.7	+ 1.13	59 42.5	+ 1.00	20 3.5	2.46	24.3
8	16 20.8	16 23.2	59 53.7	0.83	60 2.6	0.64	21 3.6	2.54	25.3
9	16 24.9	16 25.9	60 9.0	+ 0.41	60 12.4	+ 0.15	22 5.0	2.55	26.3
10	16 25.9	16 25.1	60 12.7	- 0.11	60 9.6	- 0.40	23 5.8	2.49	27.3
11	16 23.3	16 20.6	60 3.1	0.69	59 53.1	0.97	0		28.3
12	16 17.0	16 12.6	59 39.8	1.23	59 23.5	1.48	0 4.1	2.37	29.3
13	16 7.4	16 1.6	59 4.4	- 1.68	58 43.2	- 1.85	0 59.3	2.22	0.8
14	15 55.3	15 48.7	58 20.2	1.97	57 55.9	2.05	1 51.0	2.09	1.8
15	15 42.0	15 35.1	57 31.1	2.08	57 6.1	2.07	2 39.9	1.98	2.8
16	15 28.4	15 22.0	56 41.5	- 2.02	56 17.7	- 1.93	3 26.3	1.91	3.8
17	15 15.8	15 10.2	55 55.2	1.80	55 34.4	1.66	4 11.6	1.87	4.8
18	15 5.0	15 0.5	55 15.5	1.49	54 58.7	1.30	4 56.3	1.88	5.8
19	14 56.5	14 53.3	54 44.3	- 1.10	54 32.4	- 0.88	5 41.2	1.92	6.8
20	14 50.8	14 49.0	54 23.1	0.66	54 16.5	0.45	6 26.7	1.97	7.8
21	14 47.8	14 47.4	54 12.4	- 0.23	54 10.9	- 0.02	7 13.4	2.01	8.8
22	14 47.7	14 48.7	54 11.9	+ 0.18	54 15.4	+ 0.38	8 1.1	2.03	9.8
23	14 50.2	14 52.3	54 21.1	0.56	54 28.8	0.73	8 49.8	2.05	10.8
24	14 55.0	14 58.1	54 38.5	0.88	54 49.9	1.01	9 39.0	2.05	11.8
25	15 1.6	15 5.4	55 2.8	+ 1.12	55 16.9	+ 1.21	10 28.2	2.05	12.8
26	15 9.5	15 13.7	55 31.8	1.28	55 47.5	1.32	11 17.1	2.03	13.8
27	15 18.2	15 22.6	56 3.7	1.35	56 20.0	1.36	12 5.5	2.00	14.8
28	15 27.0	15 31.4	56 36.3	1.35	56 52.3	1.32	12 53.3	1.99	15.8
29	15 35.6	15 39.7	57 7.9	+ 1.28	57 22.9	+ 1.22	13 40.9	1.99	16.8

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 1.					SUNDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	11 11 27.19	2.0535	N. 9 6 52.5	10.514	0	12 49 56.23	2.0672	S. 0 0 8.4	11.946
1	11 13 30.38	2.0528	8 56 20.2	10.563	1	12 52 0.31	2.0687	0 12 5.4	11.954
2	11 15 33.53	2.0522	8 45 44.9	10.612	2	12 54 4.48	2.0703	0 24 2.9	11.961
3	11 17 36.65	2.0517	8 35 6.7	10.661	3	12 56 8.75	2.0719	0 36 0.7	11.967
4	11 19 39.73	2.0511	8 24 25.6	10.708	4	12 58 13.11	2.0735	0 47 58.9	11.972
5	11 21 42.78	2.0505	8 13 41.7	10.754	5	13 0 17.57	2.0752	0 59 57.3	11.976
6	11 23 45.79	2.0499	8 2 55.1	10.799	6	13 2 22.14	2.0771	1 11 56.0	11.979
7	11 25 48.77	2.0495	7 52 5.8	10.844	7	13 4 26.82	2.0788	1 23 54.8	11.981
8	11 27 51.73	2.0491	7 41 13.8	10.888	8	13 6 31.60	2.0807	1 35 53.7	11.982
9	11 29 54.66	2.0486	7 30 19.2	10.932	9	13 8 36.50	2.0826	1 47 52.7	11.982
10	11 31 57.56	2.0482	7 19 22.0	10.974	10	13 10 41.51	2.0845	1 59 51.6	11.982
11	11 34 0.45	2.0479	7 8 22.3	11.015	11	13 12 46.64	2.0866	2 11 50.5	11.980
12	11 36 3.31	2.0476	6 57 20.2	11.056	12	13 14 51.90	2.0887	2 23 49.2	11.977
13	11 38 6.16	2.0474	6 46 15.6	11.096	13	13 16 57.29	2.0908	2 35 47.8	11.974
14	11 40 9.00	2.0472	6 35 8.7	11.135	14	13 19 2.80	2.0930	2 47 46.1	11.968
15	11 42 11.83	2.0470	6 23 59.4	11.173	15	13 21 8.45	2.0953	2 59 44.0	11.962
16	11 44 14.64	2.0468	6 12 47.9	11.210	16	13 23 14.24	2.0977	3 11 41.6	11.957
17	11 46 17.45	2.0468	6 1 34.2	11.247	17	13 25 20.17	2.1000	3 23 38.8	11.949
18	11 48 20.26	2.0468	5 50 18.3	11.282	18	13 27 26.24	2.1024	3 35 35.5	11.940
19	11 50 23.07	2.0467	5 39 0.3	11.317	19	13 29 32.46	2.1049	3 47 31.6	11.930
20	11 52 25.87	2.0468	5 27 40.2	11.352	20	13 31 38.83	2.1074	3 59 27.1	11.919
21	11 54 28.68	2.0469	5 16 18.1	11.385	21	13 33 45.35	2.1100	4 11 21.9	11.907
22	11 56 31.50	2.0470	5 4 54.0	11.417	22	13 35 52.03	2.1127	4 23 16.0	11.894
23	11 58 34.32	2.0472	N. 4 53 28.0	11.448	23	13 37 58.87	2.1154	S. 4 35 9.2	11.880
SATURDAY 2.					MONDAY 4.				
0	12 0 37.16	2.0474	N. 4 42 0.2	11.478	0	13 40 5.88	2.1182	S. 4 47 1.6	11.866
1	12 2 40.01	2.0477	4 30 30.6	11.508	1	13 42 13.05	2.1210	4 58 53.1	11.849
2	12 4 42.88	2.0480	4 18 59.2	11.537	2	13 44 20.40	2.1239	5 10 43.5	11.832
3	12 6 45.77	2.0483	4 7 26.1	11.566	3	13 46 27.92	2.1267	5 22 32.9	11.814
4	12 8 48.68	2.0487	3 55 51.3	11.593	4	13 48 35.61	2.1297	5 34 21.2	11.795
5	12 10 51.61	2.0492	3 44 14.9	11.619	5	13 50 43.49	2.1328	5 46 8.3	11.774
6	12 12 54.58	2.0497	3 32 37.0	11.644	6	13 52 51.55	2.1360	5 57 54.1	11.752
7	12 14 57.58	2.0502	3 20 57.6	11.668	7	13 54 59.81	2.1392	6 9 38.6	11.730
8	12 17 0.61	2.0507	3 9 16.8	11.692	8	13 57 8.25	2.1423	6 21 21.7	11.707
9	12 19 3.67	2.0514	2 57 34.6	11.715	9	13 59 16.88	2.1455	6 33 3.4	11.682
10	12 21 6.78	2.0522	2 45 51.0	11.737	10	14 1 25.71	2.1489	6 44 43.5	11.656
11	12 23 9.93	2.0529	2 34 6.1	11.757	11	14 3 34.75	2.1523	6 56 22.1	11.630
12	12 25 13.13	2.0537	2 22 20.1	11.777	12	14 5 43.99	2.1557	7 7 59.1	11.602
13	12 27 16.38	2.0546	2 10 32.9	11.797	13	14 7 53.43	2.1592	7 19 34.3	11.572
14	12 29 19.68	2.0555	1 58 44.5	11.815	14	14 10 3.09	2.1628	7 31 7.7	11.541
15	12 31 23.04	2.0564	1 46 55.1	11.832	15	14 12 12.96	2.1662	7 42 39.2	11.510
16	12 33 26.45	2.0573	1 35 4.7	11.848	16	14 14 23.04	2.1698	7 54 8.9	11.477
17	12 35 29.92	2.0584	1 23 13.3	11.864	17	14 16 33.34	2.1736	8 5 36.5	11.443
18	12 37 33.46	2.0596	1 11 21.0	11.878	18	14 18 43.87	2.1774	8 17 2.1	11.408
19	12 39 37.07	2.0607	0 59 27.9	11.892	19	14 20 54.63	2.1812	8 28 25.5	11.372
20	12 41 40.75	2.0619	0 47 34.0	11.905	20	14 23 5.61	2.1849	8 39 46.7	11.335
21	12 43 44.50	2.0632	0 35 39.3	11.917	21	14 25 16.82	2.1888	8 51 5.7	11.297
22	12 45 48.33	2.0645	0 23 44.0	11.927	22	14 27 28.27	2.1928	9 2 22.3	11.257
23	12 47 52.24	2.0658	N. 0 11 48.1	11.937	23	14 29 39.96	2.1967	9 13 36.5	11.217
24	12 49 56.23	2.0672	S. 0 0 8.4	11.946	24	14 31 51.88	2.2007	S. 9 24 48.3	11.175

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 5.					THURSDAY 7.				
0	14 31 51.88	2.2007	S. 9 24 48.3	11.175	0	16 22 50.42	2.4313	S. 17 9 7.4	7.678
1	14 34 4.05	2.2049	9 35 57.5	11.131	1	16 25 16.45	2.4364	17 16 45.0	7.574
2	14 36 16.47	2.2090	9 47 4.0	11.087	2	16 27 42.79	2.4414	17 24 16.3	7.468
3	14 38 29.13	2.2132	9 58 7.9	11.041	3	16 30 9.42	2.4463	17 31 41.2	7.362
4	14 40 42.05	2.2174	10 9 8.9	10.993	4	16 32 36.35	2.4512	17 38 59.7	7.254
5	14 42 55.22	2.2217	10 20 7.1	10.947	5	16 35 3.57	2.4562	17 46 11.7	7.144
6	14 45 8.65	2.2260	10 31 2.5	10.898	6	16 37 31.09	2.4610	17 53 17.0	7.033
7	14 47 22.34	2.2303	10 41 54.8	10.846	7	16 39 58.89	2.4658	18 0 15.7	6.922
8	14 49 36.29	2.2347	10 52 44.0	10.794	8	16 42 26.99	2.4707	18 7 7.6	6.808
9	14 51 50.50	2.2391	11 3 30.1	10.742	9	16 44 55.38	2.4755	18 13 52.7	6.694
10	14 54 4.98	2.2436	11 14 13.0	10.688	10	16 47 24.05	2.4802	18 20 30.9	6.578
11	14 56 19.73	2.2481	11 24 52.6	10.632	11	16 49 53.00	2.4848	18 27 2.1	6.462
12	14 58 34.75	2.2527	11 35 28.9	10.576	12	16 52 22.23	2.4895	18 33 26.3	6.344
13	15 0 50.05	2.2572	11 46 1.7	10.517	13	16 54 51.74	2.4942	18 39 43.4	6.225
14	15 3 5.62	2.2618	11 56 31.0	10.459	14	16 57 21.53	2.4987	18 45 53.3	6.105
15	15 5 21.47	2.2665	12 6 56.8	10.398	15	16 59 51.59	2.5033	18 51 56.0	5.983
16	15 7 37.60	2.2712	12 17 18.8	10.336	16	17 2 21.92	2.5077	18 57 51.3	5.860
17	15 9 54.02	2.2760	12 27 37.1	10.273	17	17 4 52.52	2.5121	19 3 39.2	5.737
18	15 12 10.72	2.2807	12 37 51.6	10.209	18	17 7 23.37	2.5164	19 9 19.7	5.612
19	15 14 27.71	2.2856	12 48 2.2	10.144	19	17 9 54.49	2.5207	19 14 52.7	5.487
20	15 16 44.99	2.2903	12 58 8.9	10.077	20	17 12 25.86	2.5249	19 20 18.1	5.360
21	15 19 2.55	2.2951	13 8 11.5	10.009	21	17 14 57.48	2.5291	19 25 35.9	5.232
22	15 21 20.40	2.3000	13 18 10.0	9.940	22	17 17 29.35	2.5332	19 30 45.9	5.102
23	15 23 38.55	2.3049	S. 13 28 4.3	9.869	23	17 20 1.47	2.5374	S. 19 35 48.2	4.972
WEDNESDAY 6.					FRIDAY 8.				
0	15 25 56.99	2.3098	S. 13 37 54.3	9.797	0	17 22 33.82	2.5412	S. 19 40 42.6	4.842
1	15 28 15.73	2.3148	13 47 40.0	9.724	1	17 25 6.41	2.5451	19 45 29.2	4.710
2	15 30 34.77	2.3198	13 57 21.2	9.649	2	17 27 39.23	2.5489	19 50 7.8	4.577
3	15 32 54.11	2.3247	14 6 57.9	9.574	3	17 30 12.28	2.5527	19 54 38.4	4.443
4	15 35 13.74	2.3298	14 16 30.0	9.496	4	17 32 45.55	2.5563	19 59 1.0	4.308
5	15 37 33.68	2.3348	14 25 57.4	9.417	5	17 35 19.04	2.5598	20 3 15.4	4.172
6	15 39 53.92	2.3398	14 35 20.1	9.338	6	17 37 52.73	2.5633	20 7 21.7	4.036
7	15 42 14.46	2.3449	14 44 38.0	9.257	7	17 40 26.64	2.5668	20 11 19.7	3.898
8	15 44 35.31	2.3500	14 53 50.9	9.174	8	17 43 0.75	2.5701	20 15 9.5	3.760
9	15 46 56.46	2.3550	15 2 58.9	9.091	9	17 45 35.05	2.5733	20 18 50.9	3.621
10	15 49 17.91	2.3601	15 12 1.8	9.006	10	17 48 9.55	2.5765	20 22 24.0	3.481
11	15 51 39.67	2.3652	15 20 59.6	8.920	11	17 50 44.23	2.5795	20 25 48.6	3.340
12	15 54 1.74	2.3703	15 29 52.2	8.832	12	17 53 19.09	2.5825	20 29 4.8	3.199
13	15 56 24.11	2.3754	15 38 39.5	8.743	13	17 55 54.13	2.5853	20 32 12.5	3.057
14	15 58 46.79	2.3806	15 47 21.4	8.652	14	17 58 29.33	2.5881	20 35 11.6	2.914
15	16 1 9.78	2.3857	15 55 57.8	8.561	15	18 1 4.70	2.5908	20 38 2.2	2.771
16	16 3 33.08	2.3908	16 4 28.7	8.468	16	18 3 40.23	2.5933	20 40 44.1	2.626
17	16 5 56.68	2.3958	16 12 54.0	8.374	17	18 6 15.90	2.5957	20 43 17.3	2.481
18	16 8 20.58	2.4009	16 21 13.6	8.279	18	18 8 51.72	2.5982	20 45 41.8	2.336
19	16 10 44.79	2.4061	16 29 27.5	8.182	19	18 11 27.69	2.6005	20 47 57.6	2.190
20	16 13 9.31	2.4112	16 37 35.5	8.083	20	18 14 3.78	2.6026	20 50 4.6	2.043
21	16 15 34.13	2.4162	16 45 37.5	7.984	21	18 16 40.00	2.6046	20 52 2.8	1.897
22	16 17 59.26	2.4213	16 53 33.6	7.884	22	18 19 16.33	2.6065	20 53 52.2	1.749
23	16 20 24.69	2.4263	17 1 23.6	7.782	23	18 21 52.78	2.6083	20 55 32.7	1.601
24	16 22 50.42	2.4313	S. 17 9 7.4	7.678	24	18 24 29.33	2.6100	S. 20 57 4.3	1.453

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 9.					MONDAY 11.				
0	18 24 29.33	2.6100	S. 20 57 4.3	1.453	0	20 29 28.61	2.5536	S. 19 15 28.0	5.545
1	18 27 5.98	2.6116	20 58 27.0	1.304	1	20 32 1.71	2.5497	19 9 51.4	5.675
2	18 29 42.72	2.6131	20 59 40.8	1.155	2	20 34 34.58	2.5459	19 4 7.0	5.805
3	18 32 19.55	2.6145	21 0 45.6	1.005	3	20 37 7.22	2.5420	18 58 14.8	5.933
4	18 34 56.46	2.6157	21 1 41.4	0.856	4	20 39 39.62	2.5380	18 52 15.0	6.060
5	18 37 33.43	2.6167	21 2 28.3	0.706	5	20 42 11.78	2.5338	18 46 7.6	6.187
6	18 40 10.47	2.6177	21 3 6.1	0.555	6	20 44 43.68	2.5296	18 39 52.6	6.312
7	18 42 47.56	2.6187	21 3 34.9	0.405	7	20 47 15.33	2.5253	18 33 30.2	6.435
8	18 45 24.71	2.6195	21 3 54.7	0.255	8	20 49 46.72	2.5210	18 27 0.4	6.558
9	18 48 1.90	2.6201	21 4 5.5	-0.104	9	20 52 17.85	2.5167	18 20 23.2	6.680
10	18 50 39.12	2.6206	21 4 7.2	+0.047	10	20 54 48.72	2.5122	18 13 38.8	6.799
11	18 53 16.37	2.6211	21 3 59.8	0.198	11	20 57 19.31	2.5076	18 6 47.3	6.918
12	18 55 53.65	2.6214	21 3 43.4	0.349	12	20 59 49.63	2.5030	17 59 48.6	7.037
13	18 58 30.94	2.6215	21 3 17.9	0.500	13	21 2 19.67	2.4983	17 52 42.9	7.153
14	19 1 8.23	2.6214	21 2 43.4	0.651	14	21 4 49.43	2.4937	17 45 30.3	7.267
15	19 3 45.51	2.6213	21 1 59.8	0.802	15	21 7 18.91	2.4889	17 38 10.9	7.381
16	19 6 22.79	2.6212	21 1 7.1	0.953	16	21 9 48.10	2.4841	17 30 44.6	7.494
17	19 9 0.06	2.6209	21 0 5.4	1.103	17	21 12 17.00	2.4793	17 23 11.6	7.605
18	19 11 37.30	2.6203	20 58 54.7	1.254	18	21 14 45.61	2.4743	17 15 32.0	7.714
19	19 14 14.50	2.6197	20 57 34.9	1.405	19	21 17 13.92	2.4693	17 7 45.9	7.822
20	19 16 51.67	2.6192	20 56 6.1	1.554	20	21 19 41.93	2.4643	16 59 53.3	7.929
21	19 19 28.80	2.6184	20 54 28.4	1.704	21	21 22 9.64	2.4593	16 51 54.4	8.035
22	19 22 5.88	2.6174	20 52 41.6	1.855	22	21 24 37.05	2.4542	16 43 49.1	8.140
23	19 24 42.89	2.6162	S. 20 50 45.8	2.004	23	21 27 4.14	2.4490	S. 16 35 37.6	8.243
SUNDAY 10.					TUESDAY 12.				
0	19 27 19.83	2.6151	S. 20 48 41.1	2.152	0	21 29 30.93	2.4439	S. 16 27 19.9	8.344
1	19 29 56.70	2.6138	20 46 27.5	2.301	1	21 31 57.41	2.4387	16 18 56.3	8.443
2	19 32 33.49	2.6124	20 44 5.0	2.450	2	21 34 23.58	2.4335	16 10 26.7	8.542
3	19 35 10.19	2.6109	20 41 33.5	2.597	3	21 36 49.43	2.4282	16 1 51.2	8.639
4	19 37 46.80	2.6092	20 38 53.3	2.744	4	21 39 14.97	2.4230	15 53 10.0	8.735
5	19 40 23.30	2.6074	20 36 4.2	2.891	5	21 41 40.19	2.4177	15 44 23.0	8.829
6	19 42 59.69	2.6056	20 33 6.4	3.037	6	21 44 5.09	2.4122	15 35 30.5	8.922
7	19 45 35.97	2.6036	20 29 59.8	3.183	7	21 46 29.66	2.4069	15 26 32.4	9.013
8	19 48 12.12	2.6014	20 26 44.4	3.328	8	21 48 53.92	2.4017	15 17 28.9	9.102
9	19 50 48.14	2.5992	20 23 20.4	3.473	9	21 51 17.86	2.3963	15 8 20.1	9.191
10	19 53 24.03	2.5970	20 19 47.7	3.617	10	21 53 41.47	2.3907	14 59 6.0	9.278
11	19 55 59.78	2.5945	20 16 6.4	3.759	11	21 56 4.75	2.3853	14 49 46.7	9.364
12	19 58 35.37	2.5919	20 12 16.6	3.902	12	21 58 27.71	2.3799	14 40 22.3	9.447
13	20 1 10.81	2.5893	20 8 18.2	4.043	13	22 0 50.34	2.3746	14 30 53.0	9.529
14	20 3 46.09	2.5866	20 4 11.4	4.184	14	22 3 12.66	2.3692	14 21 18.8	9.611
15	20 6 21.20	2.5837	19 59 56.1	4.324	15	22 5 34.64	2.3636	14 11 39.7	9.690
16	20 8 56.13	2.5807	19 55 32.5	4.463	16	22 7 56.29	2.3582	14 1 56.0	9.767
17	20 11 30.88	2.5777	19 51 0.5	4.602	17	22 10 17.62	2.3528	13 52 7.7	9.843
18	20 14 5.45	2.5745	19 46 20.3	4.739	18	22 12 38.63	2.3474	13 42 14.8	9.919
19	20 16 39.82	2.5712	19 41 31.8	4.877	19	22 14 59.31	2.3419	13 32 17.4	9.992
20	20 19 14.00	2.5679	19 36 35.1	5.012	20	22 17 19.66	2.3364	13 22 15.7	10.064
21	20 21 47.97	2.5644	19 31 30.4	5.146	21	22 19 39.68	2.3310	13 12 9.7	10.134
22	20 24 21.73	2.5609	19 26 17.6	5.280	22	22 21 59.38	2.3256	13 1 59.6	10.203
23	20 26 55.28	2.5573	19 20 56.8	5.413	23	22 24 18.75	2.3202	12 51 45.4	10.271
24	20 29 28.61	2.5536	S. 19 15 28.0	5.545	24	22 26 37.80	2.3147	S. 12 41 27.1	10.337

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 13.					FRIDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	22 26 37.80	2.3147	S. 12 41 27.1	10.337	0	0 12 0.69	2.0909	S. 3 36 1.5	11.887
1	22 28 56.52	2.3093	12 31 5.0	10.401	1	0 14 6.04	2.0873	3 24 8.2	11.889
2	22 31 14.92	2.3040	12 20 39.0	10.464	2	0 16 11.17	2.0838	3 12 14.8	11.891
3	22 33 33.00	2.2987	12 10 9.3	10.526	3	0 18 16.10	2.0804	3 0 21.3	11.891
4	22 35 50.76	2.2932	11 59 35.9	10.586	4	0 20 20.82	2.0769	2 48 27.9	11.890
5	22 38 8.19	2.2879	11 48 59.0	10.644	5	0 22 25.33	2.0736	2 36 34.5	11.888
6	22 40 25.31	2.2827	11 38 18.6	10.702	6	0 24 29.65	2.0703	2 24 41.3	11.886
7	22 42 42.11	2.2773	11 27 34.8	10.757	7	0 26 33.77	2.0670	2 12 48.2	11.882
8	22 44 58.59	2.2720	11 16 47.7	10.812	8	0 28 37.69	2.0638	2 0 55.5	11.876
9	22 47 14.75	2.2667	11 5 57.4	10.864	9	0 30 41.42	2.0607	1 49 3.1	11.871
10	22 49 30.60	2.2616	10 55 4.0	10.916	10	0 32 44.97	2.0577	1 37 11.0	11.864
11	22 51 46.14	2.2563	10 44 7.5	10.966	11	0 34 48.34	2.0546	1 25 19.4	11.856
12	22 54 1.36	2.2511	10 33 8.1	11.014	12	0 36 51.52	2.0515	1 13 28.3	11.847
13	22 56 16.27	2.2460	10 22 5.8	11.061	13	0 38 54.52	2.0486	1 1 37.8	11.837
14	22 58 30.88	2.2410	10 11 0.8	11.107	14	0 40 57.35	2.0457	0 49 47.8	11.827
15	23 0 45.19	2.2359	9 59 53.0	11.152	15	0 43 0.01	2.0429	0 37 58.5	11.815
16	23 2 59.19	2.2307	9 48 42.6	11.194	16	0 45 2.50	2.0402	0 26 10.0	11.802
17	23 5 12.88	2.2257	9 37 29.7	11.236	17	0 47 4.83	2.0374	0 14 22.2	11.789
18	23 7 26.28	2.2208	9 26 14.3	11.276	18	0 49 6.99	2.0347	S. 0 2 35.3	11.775
19	23 9 39.38	2.2158	9 14 56.6	11.314	19	0 51 9.00	2.0322	N. 0 9 10.8	11.760
20	23 11 52.18	2.2109	9 3 36.6	11.352	20	0 53 10.86	2.0297	0 20 55.9	11.743
21	23 14 4.69	2.2061	8 52 14.3	11.389	21	0 55 12.56	2.0271	0 32 40.0	11.726
22	23 16 16.91	2.2012	8 40 49.9	11.423	22	0 57 14.11	2.0247	0 44 23.0	11.708
23	23 18 28.84	2.1965	S. 8 29 23.5	11.457	23	0 59 15.52	2.0223	N. 0 56 4.9	11.689
THURSDAY 14.					SATURDAY 16.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	23 20 40.49	2.1917	S. 8 17 55.1	11.489	0	1 1 16.79	2.0200	N. 1 7 45.7	11.670
1	23 22 51.85	2.1869	8 6 24.8	11.519	1	1 3 17.92	2.0177	1 19 25.3	11.650
2	23 25 2.92	2.1822	7 54 52.8	11.548	2	1 5 18.91	2.0154	1 31 3.7	11.629
3	23 27 13.72	2.1777	7 43 19.0	11.577	3	1 7 19.77	2.0133	1 42 40.8	11.607
4	23 29 24.24	2.1731	7 31 43.6	11.604	4	1 9 20.51	2.0112	1 54 16.5	11.583
5	23 31 34.49	2.1685	7 20 6.5	11.630	5	1 11 21.12	2.0092	2 5 50.8	11.560
6	23 33 44.46	2.1639	7 8 28.0	11.653	6	1 13 21.61	2.0072	2 17 23.7	11.536
7	23 35 54.16	2.1595	6 56 48.1	11.677	7	1 15 21.98	2.0052	2 28 55.1	11.510
8	23 38 3.60	2.1552	6 45 6.8	11.699	8	1 17 22.23	2.0032	2 40 24.9	11.484
9	23 40 12.78	2.1507	6 33 24.2	11.720	9	1 19 22.37	2.0014	2 51 53.2	11.457
10	23 42 21.69	2.1464	6 21 40.4	11.739	10	1 21 22.40	1.9997	3 3 19.8	11.429
11	23 44 30.35	2.1422	6 9 55.5	11.757	11	1 23 22.33	1.9979	3 14 44.7	11.401
12	23 46 38.75	2.1379	5 58 9.5	11.774	12	1 25 22.15	1.9962	3 26 7.9	11.372
13	23 48 46.90	2.1337	5 46 22.6	11.789	13	1 27 21.87	1.9946	3 37 29.4	11.342
14	23 50 54.79	2.1295	5 34 34.8	11.804	14	1 29 21.50	1.9931	3 48 49.0	11.312
15	23 53 2.44	2.1255	5 22 46.1	11.818	15	1 31 21.04	1.9915	4 0 6.8	11.281
16	23 55 9.85	2.1215	5 10 56.6	11.830	16	1 33 20.48	1.9900	4 11 22.7	11.249
17	23 57 17.02	2.1175	4 59 6.5	11.841	17	1 35 19.84	1.9886	4 22 36.7	11.217
18	23 59 23.95	2.1135	4 47 15.7	11.851	18	1 37 19.11	1.9872	4 33 48.7	11.183
19	0 1 30.64	2.1096	4 35 24.4	11.859	19	1 39 18.30	1.9859	4 44 58.7	11.148
20	0 3 37.10	2.1057	4 23 32.6	11.867	20	1 41 17.42	1.9847	4 56 6.5	11.113
21	0 5 43.33	2.1020	4 11 40.3	11.875	21	1 43 16.46	1.9834	5 7 12.3	11.079
22	0 7 49.34	2.0983	3 59 47.6	11.880	22	1 45 15.43	1.9823	5 18 16.0	11.043
23	0 9 55.13	2.0946	3 47 54.7	11.884	23	1 47 14.33	1.9812	5 29 17.4	11.005
24	0 12 0.69	2.0909	S. 3 36 1.5	11.887	24	1 49 13.17	1.9801	N. 5 40 16.6	10.968

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 17.					TUESDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	1 49 13.17	1.9801	N. 5 40 16.6	10.968	0	3 23 56.08	1.9825	N. 13 32 9.6	8.482
1	1 51 11.94	1.9791	5 51 13.6	10.930	1	3 25 55.06	1.9836	13 40 36.6	8.417
2	1 53 10.66	1.9782	6 2 8.2	10.891	2	3 27 54.11	1.9847	13 48 59.7	8.352
3	1 55 9.32	1.9772	6 13 0.5	10.852	3	3 29 53.22	1.9857	13 57 18.9	8.287
4	1 57 7.93	1.9764	6 23 50.4	10.812	4	3 31 52.40	1.9868	14 5 34.2	8.222
5	1 59 6.49	1.9756	6 34 37.9	10.771	5	3 33 51.64	1.9878	14 13 45.5	8.154
6	2 1 5.00	1.9748	6 45 22.9	10.729	6	3 35 50.94	1.9890	14 21 52.7	8.087
7	2 3 3.47	1.9741	6 56 5.4	10.687	7	3 37 50.32	1.9902	14 29 55.9	8.020
8	2 5 1.89	1.9734	7 6 45.4	10.645	8	3 39 49.77	1.9914	14 37 55.1	7.962
9	2 7 0.28	1.9729	7 17 22.8	10.602	9	3 41 49.29	1.9927	14 45 50.2	7.884
10	2 8 58.64	1.9723	7 27 57.6	10.558	10	3 43 48.89	1.9939	14 53 41.2	7.815
11	2 10 56.96	1.9717	7 38 29.8	10.513	11	3 45 48.56	1.9952	15 1 28.0	7.746
12	2 12 55.24	1.9712	7 48 59.2	10.468	12	3 47 48.31	1.9965	15 9 10.7	7.676
13	2 14 53.50	1.9708	7 59 25.9	10.423	13	3 49 48.14	1.9978	15 16 49.1	7.605
14	2 16 51.74	1.9705	8 9 50.0	10.377	14	3 51 48.05	1.9992	15 24 23.3	7.535
15	2 18 49.96	1.9702	8 20 11.2	10.330	15	3 53 48.04	2.0006	15 31 53.3	7.464
16	2 20 48.16	1.9698	8 30 29.6	10.282	16	3 55 48.12	2.0020	15 39 19.0	7.392
17	2 22 46.34	1.9696	8 40 45.1	10.234	17	3 57 48.28	2.0034	15 46 40.4	7.320
18	2 24 44.51	1.9694	8 50 57.7	10.186	18	3 59 48.53	2.0048	15 53 57.4	7.247
19	2 26 42.67	1.9692	9 1 7.4	10.137	19	4 1 48.86	2.0063	16 1 10.1	7.175
20	2 28 40.82	1.9692	9 11 14.2	10.088	20	4 3 49.29	2.0078	16 8 18.4	7.101
21	2 30 38.97	1.9691	9 21 18.0	10.037	21	4 5 49.80	2.0093	16 15 22.2	7.027
22	2 32 37.11	1.9691	9 31 18.7	9.987	22	4 7 50.41	2.0108	16 22 21.6	6.953
23	2 34 35.26	1.9691	N. 9 41 16.4	9.936	23	4 9 51.10	2.0123	N. 16 29 16.6	6.878
MONDAY 18.					WEDNESDAY 20.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	2 36 33.40	1.9691	N. 9 51 11.0	9.884	0	4 11 51.89	2.0140	N. 16 36 7.0	6.802
1	2 38 31.55	1.9692	10 1 2.5	9.831	1	4 13 52.78	2.0156	16 42 52.9	6.727
2	2 40 29.71	1.9694	10 10 50.7	9.777	2	4 15 53.76	2.0172	16 49 34.3	6.652
3	2 42 27.88	1.9696	10 20 35.8	9.725	3	4 17 54.84	2.0188	16 56 11.1	6.575
4	2 44 26.06	1.9698	10 30 17.7	9.671	4	4 19 56.02	2.0204	17 2 43.3	6.497
5	2 46 24.26	1.9702	10 39 56.3	9.616	5	4 21 57.29	2.0220	17 9 10.8	6.420
6	2 48 22.48	1.9705	10 49 31.6	9.561	6	4 23 58.66	2.0237	17 15 33.7	6.342
7	2 50 20.72	1.9708	10 59 3.6	9.505	7	4 26 0.14	2.0254	17 21 51.9	6.264
8	2 52 18.98	1.9712	11 8 32.2	9.449	8	4 28 1.71	2.0271	17 28 5.4	6.186
9	2 54 17.26	1.9716	11 17 57.5	9.393	9	4 30 3.39	2.0288	17 34 14.2	6.107
10	2 56 15.57	1.9722	11 27 19.4	9.336	10	4 32 5.17	2.0305	17 40 18.2	6.028
11	2 58 13.92	1.9727	11 36 37.8	9.277	11	4 34 7.05	2.0322	17 46 17.5	5.947
12	3 0 12.29	1.9732	11 45 52.7	9.219	12	4 36 9.04	2.0340	17 52 11.9	5.867
13	3 2 10.70	1.9738	11 55 4.1	9.161	13	4 38 11.13	2.0357	17 58 1.5	5.787
14	3 4 9.15	1.9744	12 4 12.0	9.102	14	4 40 13.33	2.0375	18 3 46.3	5.705
15	3 6 7.63	1.9751	12 13 16.3	9.043	15	4 42 15.63	2.0392	18 9 26.1	5.623
16	3 8 6.16	1.9758	12 22 17.0	8.982	16	4 44 18.04	2.0410	18 15 1.0	5.542
17	3 10 4.73	1.9765	12 31 14.1	8.921	17	4 46 20.55	2.0427	18 20 31.1	5.459
18	3 12 3.34	1.9772	12 40 7.5	8.860	18	4 48 23.17	2.0446	18 25 56.1	5.376
19	3 14 2.00	1.9781	12 48 57.3	8.798	19	4 50 25.90	2.0463	18 31 16.2	5.292
20	3 16 0.71	1.9789	12 57 43.3	8.736	20	4 52 28.73	2.0481	18 36 31.2	5.208
21	3 17 59.47	1.9798	13 6 25.6	8.673	21	4 54 31.67	2.0498	18 41 41.2	5.125
22	3 19 58.29	1.9807	13 15 4.1	8.610	22	4 56 34.71	2.0517	18 46 46.2	5.041
23	3 21 57.16	1.9816	13 23 38.8	8.546	23	4 58 37.87	2.0535	18 51 46.1	4.956
24	3 23 56.08	1.9825	N. 13 32 9.6	8.482	24	5 0 41.13	2.0552	N. 18 56 40.9	4.871

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 21.					SATURDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	5 0 41.13	2.0552	N.18 56 40.9	4.871	0	6 41 16.91	2.1306	N.21 5 34.9	0.384
1	5 2 44.50	2.0571	19 1 30.6	4.785	1	6 43 24.78	2.1317	21 5 55.0	0.284
2	5 4 47.98	2.0589	19 6 15.1	4.699	2	6 45 32.71	2.1327	21 6 9.0	0.184
3	5 6 51.57	2.0607	19 10 54.5	4.613	3	6 47 40.71	2.1337	21 6 17.1	+ 0.085
4	5 8 55.26	2.0624	19 15 28.7	4.526	4	6 49 48.76	2.1347	21 6 19.2	- 0.016
5	5 10 59.06	2.0642	19 19 57.6	4.438	5	6 51 56.88	2.1357	21 6 15.2	0.117
6	5 13 2.97	2.0661	19 24 21.3	4.351	6	6 54 5.05	2.1367	21 6 5.2	0.217
7	5 15 6.99	2.0679	19 28 39.7	4.263	7	6 56 13.28	2.1376	21 5 49.1	0.318
8	5 17 11.12	2.0697	19 32 52.9	4.175	8	6 58 21.56	2.1385	21 5 27.0	0.418
9	5 19 15.35	2.0714	19 37 0.7	4.086	9	7 0 29.90	2.1394	21 4 58.9	0.519
10	5 21 19.69	2.0732	19 41 3.2	3.997	10	7 2 38.29	2.1402	21 4 24.7	0.620
11	5 23 24.14	2.0750	19 45 0.4	3.907	11	7 4 46.73	2.1410	21 3 44.5	0.721
12	5 25 28.69	2.0767	19 48 52.1	3.817	12	7 6 55.21	2.1417	21 2 58.2	0.822
13	5 27 33.35	2.0785	19 52 38.5	3.728	13	7 9 3.74	2.1425	21 2 5.8	0.924
14	5 29 38.11	2.0802	19 56 19.5	3.637	14	7 11 12.31	2.1432	21 1 7.3	1.025
15	5 31 42.98	2.0821	19 59 55.0	3.546	15	7 13 20.93	2.1439	21 0 2.8	1.127
16	5 33 47.96	2.0838	20 3 25.0	3.455	16	7 15 29.58	2.1445	20 58 52.1	1.228
17	5 35 53.03	2.0854	20 6 49.6	3.364	17	7 17 38.27	2.1452	20 57 35.4	1.330
18	5 37 58.21	2.0872	20 10 8.7	3.272	18	7 19 47.00	2.1457	20 56 12.5	1.432
19	5 40 3.49	2.0889	20 13 22.3	3.180	19	7 21 55.76	2.1463	20 54 43.6	1.533
20	5 42 8.88	2.0906	20 16 30.3	3.087	20	7 24 4.56	2.1468	20 53 8.5	1.635
21	5 44 14.36	2.0922	20 19 32.8	2.995	21	7 26 13.38	2.1473	20 51 27.4	1.736
22	5 45 19.94	2.0939	20 22 29.7	2.902	22	7 28 22.24	2.1478	20 49 40.2	1.837
23	5 48 25.63	2.0956	N.20 25 21.1	2.809	23	7 30 31.12	2.1482	N.20 47 46.9	1.939
FRIDAY 22.					SUNDAY 24.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	5 50 31.41	2.0972	N.20 28 6.8	2.715	0	7 32 40.02	2.1486	N.20 45 47.5	2.041
1	5 52 37.29	2.0988	20 30 46.9	2.621	1	7 34 48.95	2.1490	20 43 42.0	2.143
2	5 54 43.27	2.1004	20 33 21.3	2.526	2	7 36 57.90	2.1492	20 41 30.3	2.245
3	5 56 49.34	2.1020	20 35 50.0	2.432	3	7 39 6.86	2.1495	20 39 12.6	2.346
4	5 58 55.51	2.1036	20 38 13.1	2.337	4	7 41 15.84	2.1498	20 36 48.8	2.447
5	6 1 1.77	2.1051	20 40 30.4	2.241	5	7 43 24.84	2.1502	20 34 18.9	2.549
6	6 3 8.12	2.1067	20 42 42.0	2.146	6	7 45 33.86	2.1503	20 31 42.9	2.651
7	6 5 14.57	2.1082	20 44 47.9	2.051	7	7 47 42.88	2.1504	20 29 0.8	2.752
8	6 7 21.10	2.1097	20 46 48.1	1.954	8	7 49 51.91	2.1506	20 26 12.7	2.852
9	6 9 27.73	2.1112	20 48 42.4	1.858	9	7 52 0.95	2.1507	20 23 18.5	2.954
10	6 11 34.44	2.1126	20 50 31.0	1.761	10	7 54 10.00	2.1508	20 20 18.2	3.056
11	6 13 41.24	2.1140	20 52 13.7	1.663	11	7 56 19.05	2.1509	20 17 11.8	3.157
12	6 15 48.12	2.1154	20 53 50.6	1.567	12	7 58 28.11	2.1509	20 13 59.4	3.257
13	6 17 55.09	2.1168	20 55 21.7	1.470	13	8 0 37.16	2.1508	20 10 40.9	3.358
14	6 20 2.14	2.1182	20 56 47.0	1.372	14	8 2 46.21	2.1509	20 7 16.4	3.458
15	6 22 9.28	2.1196	20 58 6.4	1.274	15	8 4 55.27	2.1508	20 3 45.9	3.559
16	6 24 16.49	2.1209	20 59 19.9	1.176	16	8 7 4.31	2.1506	20 0 9.3	3.660
17	6 26 23.79	2.1223	21 0 27.5	1.077	17	8 9 13.34	2.1505	19 56 26.7	3.759
18	6 28 31.16	2.1235	21 1 29.2	0.979	18	8 11 22.37	2.1504	19 52 38.2	3.859
19	6 30 38.61	2.1247	21 2 25.0	0.881	19	8 13 31.39	2.1502	19 48 43.6	3.959
20	6 32 46.13	2.1259	21 3 14.9	0.782	20	8 15 40.40	2.1500	19 44 43.1	4.058
21	6 34 53.72	2.1271	21 3 58.9	0.683	21	8 17 49.39	2.1497	19 40 36.6	4.158
22	6 37 1.38	2.1282	21 4 36.9	0.583	22	8 19 58.36	2.1494	19 36 24.1	4.257
23	6 39 9.11	2.1294	21 5 8.9	0.483	23	8 22 7.32	2.1492	19 32 5.7	4.356
24	6 41 16.91	2.1306	N.21 5 34.9	0.384	24	8 24 16.26	2.1488	N.19 27 41.4	4.455

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 25.					WEDNESDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 24 16.26	2.1488	N.19 27 41.4	4.455	0	10 6 39.12	2.1121	N.14 6 49.3	8.738
1	8 26 25.18	2.1485	19 23 11.1	4.553	1	10 8 45.82	2.1112	13 58 2.7	8.815
2	8 28 34.08	2.1482	19 18 35.0	4.651	2	10 10 52.46	2.1102	13 49 11.5	8.891
3	8 30 42.96	2.1477	19 13 53.0	4.749	3	10 12 59.04	2.1092	13 40 15.8	8.965
4	8 32 51.81	2.1472	19 9 5.1	4.847	4	10 15 5.57	2.1083	13 31 15.7	9.039
5	8 35 0.63	2.1468	19 4 11.4	4.944	5	10 17 12.04	2.1074	13 22 11.1	9.113
6	8 37 9.43	2.1464	18 59 11.8	5.042	6	10 19 18.46	2.1065	13 13 2.1	9.187
7	8 39 18.20	2.1458	18 54 6.4	5.138	7	10 21 24.82	2.1056	13 3 48.7	9.259
8	8 41 26.93	2.1452	18 48 55.3	5.234	8	10 23 31.13	2.1047	12 54 31.0	9.330
9	8 43 35.63	2.1447	18 43 38.3	5.331	9	10 25 37.38	2.1037	12 45 9.1	9.400
10	8 45 44.30	2.1442	18 38 15.6	5.426	10	10 27 43.58	2.1029	12 35 43.0	9.470
11	8 47 52.94	2.1436	18 32 47.2	5.522	11	10 29 49.73	2.1020	12 26 12.7	9.540
12	8 50 1.53	2.1429	18 27 13.0	5.617	12	10 31 55.82	2.1012	12 16 38.2	9.608
13	8 52 10.09	2.1424	18 21 33.1	5.712	13	10 34 1.87	2.1003	12 6 59.7	9.676
14	8 54 18.62	2.1417	18 15 47.6	5.806	14	10 36 7.86	2.0995	11 57 17.1	9.743
15	8 56 27.10	2.1410	18 9 56.4	5.901	15	10 38 13.81	2.0987	11 47 30.5	9.809
16	8 58 35.54	2.1403	18 3 59.5	5.994	16	10 40 19.70	2.0978	11 37 40.0	9.874
17	9 0 43.94	2.1397	17 57 57.1	6.087	17	10 42 25.55	2.0972	11 27 45.6	9.939
18	9 2 52.30	2.1389	17 51 49.1	6.180	18	10 44 31.36	2.0964	11 17 47.3	10.003
19	9 5 0.61	2.1382	17 45 35.5	6.273	19	10 46 37.12	2.0956	11 7 45.2	10.067
20	9 7 8.88	2.1374	17 39 16.3	6.365	20	10 48 42.83	2.0948	10 57 39.3	10.129
21	9 9 17.10	2.1366	17 32 51.7	6.456	21	10 50 48.50	2.0941	10 47 29.7	10.191
22	9 11 25.27	2.1358	17 26 21.6	6.547	22	10 52 54.12	2.0934	10 37 16.4	10.252
23	9 13 33.40	2.1350	N.17 19 46.0	6.638	23	10 54 59.71	2.0927	N.10 26 59.5	10.311
TUESDAY 26.					THURSDAY 28.				
0	9 15 41.47	2.1342	N.17 13 5.0	6.728	0	10 57 5.25	2.0920	N.10 16 39.1	10.370
1	9 17 49.50	2.1334	17 6 18.6	6.818	1	10 59 10.75	2.0914	10 6 15.1	10.428
2	9 19 57.48	2.1325	16 59 26.8	6.908	2	11 1 16.22	2.0908	9 55 47.7	10.486
3	9 22 5.40	2.1316	16 52 29.6	6.997	3	11 3 21.65	2.0902	9 45 16.8	10.543
4	9 24 13.27	2.1307	16 45 27.1	7.085	4	11 5 27.05	2.0897	9 34 42.5	10.598
5	9 26 21.09	2.1299	16 38 19.4	7.172	5	11 7 32.41	2.0891	9 24 5.0	10.653
6	9 28 28.86	2.1291	16 31 6.4	7.261	6	11 9 37.74	2.0886	9 13 24.1	10.708
7	9 30 36.58	2.1282	16 23 48.1	7.348	7	11 11 43.04	2.0881	9 2 40.0	10.761
8	9 32 44.24	2.1272	16 16 24.6	7.434	8	11 13 48.31	2.0876	8 51 52.8	10.812
9	9 34 51.84	2.1262	16 8 56.0	7.520	9	11 15 53.55	2.0871	8 41 2.5	10.864
10	9 36 59.39	2.1253	16 1 22.2	7.606	10	11 17 58.76	2.0867	8 30 9.1	10.916
11	9 39 6.88	2.1244	15 53 43.3	7.690	11	11 20 3.95	2.0863	8 19 12.6	10.965
12	9 41 14.32	2.1235	15 45 59.4	7.773	12	11 22 9.12	2.0860	8 8 13.3	11.013
13	9 43 21.70	2.1226	15 38 10.5	7.857	13	11 24 14.27	2.0857	7 57 11.0	11.062
14	9 45 29.03	2.1216	15 30 16.5	7.942	14	11 26 19.40	2.0852	7 46 5.9	11.109
15	9 47 36.29	2.1206	15 22 17.5	8.024	15	11 28 24.50	2.0849	7 34 57.9	11.156
16	9 49 43.50	2.1197	15 14 13.6	8.106	16	11 30 29.59	2.0847	7 23 47.2	11.201
17	9 51 50.66	2.1187	15 6 4.8	8.187	17	11 32 34.67	2.0846	7 12 33.8	11.245
18	9 53 57.75	2.1177	14 57 51.2	8.267	18	11 34 39.74	2.0844	7 1 17.8	11.288
19	9 56 4.79	2.1168	14 49 32.7	8.348	19	11 36 44.80	2.0842	6 49 59.2	11.331
20	9 58 11.77	2.1158	14 41 9.4	8.427	20	11 38 49.84	2.0840	6 38 38.1	11.372
21	10 0 18.69	2.1149	14 32 41.4	8.506	21	11 40 54.88	2.0840	6 27 14.5	11.413
22	10 2 25.56	2.1140	14 24 8.7	8.584	22	11 42 59.92	2.0839	6 15 48.5	11.452
23	10 4 32.37	2.1130	14 15 31.3	8.662	23	11 45 4.95	2.0838	6 4 20.2	11.491
24	10 6 39.12	2.1121	N.14 6 49.3	8.738	24	11 47 9.98	2.0838	N. 5 52 49.6	11.529



## PHASES OF THE MOON.

	d	h	m
( Last Quarter . . . . . Feb.	5	12	51.8
● New Moon . . . . .	12	5	42.9
) First Quarter . . . . .	19	16	34.9
○ Full Moon . . . . .	27	18	22.8

☾ Perigee . . . . .	Feb.	<sup>d</sup> 9	<sup>h</sup> 19.1
☾ Apogee . . . . .		21	12.9

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Aldebaran W.	97 5 53	2702	98 42 30	2694	100 19 18	2686	101 56 17	2677
	JUPITER W.	73 20 36	2681	74 57 42	2672	76 35 0	2663	78 12 29	2655
	Pollux W.	53 12 11	2761	54 47 30	2750	56 23 4	2739	57 58 52	2729
	Regulus W.	17 1 32	2725	18 37 39	2714	20 14 1	2703	21 50 37	2692
	Spica E.	37 39 46	2800	36 5 18	2799	34 30 49	2800	32 56 21	2802
	MARS E.	72 24 53	2916	70 52 54	2907	69 20 44	2898	67 48 23	2889
	Antares E.	83 29 41	2755	81 54 14	2746	80 18 35	2738	78 42 45	2730
	VENUS E.	99 22 47	3034	97 53 17	3026	96 23 36	3017	94 53 44	3008
2	Aldebaran W.	110 4 6	2634	111 42 15	2626	113 20 35	2617	114 59 7	2608
	JUPITER W.	86 22 42	2613	88 1 19	2604	89 40 8	2596	91 19 9	2587
	Pollux W.	66 1 15	2678	67 38 24	2669	69 15 45	2659	70 53 20	2649
	Regulus W.	29 57 8	2642	31 35 6	2632	33 13 17	2623	34 51 41	2614
	MARS E.	60 3 49	2846	58 30 21	2837	56 56 41	2828	55 22 50	2820
	Antares E.	70 41 3	2692	69 4 12	2684	67 27 11	2677	65 50 0	2670
	VENUS E.	87 21 42	2964	85 50 44	2955	84 19 35	2946	82 48 14	2936
	SUN E.	134 4 41	2982	132 34 6	2973	131 3 19	2964	129 32 21	2954
3	JUPITER W.	99 37 14	2543	101 17 27	2534	102 57 53	2525	104 38 32	2516
	Pollux W.	79 4 31	2601	80 43 24	2591	82 22 31	2582	84 1 51	2572
	Regulus W.	43 6 53	2566	44 46 34	2557	46 26 28	2548	48 6 35	2538
	MARS E.	47 30 44	2775	45 55 44	2767	44 20 34	2759	42 45 12	2750
	Antares E.	57 41 44	2635	56 3 37	2629	54 25 22	2621	52 46 59	2618
	VENUS E.	75 8 34	2890	73 36 2	2880	72 3 18	2870	70 30 22	2860
	SUN E.	121 54 25	2905	120 22 12	2895	118 49 47	2885	117 17 9	2875
4	Pollux W.	92 21 47	2525	94 2 26	2515	95 43 19	2505	97 24 25	2496
	Regulus W.	56 30 34	2489	58 12 3	2480	59 53 45	2470	61 35 41	2460
	MARS E.	34 45 34	2709	33 9 6	2702	31 32 29	2695	29 55 42	2689
	Antares E.	44 33 16	2596	42 54 15	2593	41 15 10	2592	39 36 3	2592
	VENUS E.	62 42 28	2811	61 8 15	2801	59 33 49	2791	57 59 9	2781
	SUN E.	109 30 41	2824	107 56 44	2813	106 22 33	2802	104 48 8	2792
5	Pollux W.	105 53 13	2449	107 35 38	2440	109 18 16	2431	111 1 7	2422
	Regulus W.	70 8 52	2410	71 52 13	2399	73 35 49	2389	75 19 39	2380
	Spica W.	17 39 41	2784	19 14 30	2774	20 50 51	2657	22 28 29	2611
	VENUS E.	50 2 28	2729	48 26 27	2719	46 50 12	2708	45 13 43	2698
	SUN E.	96 52 33	2738	95 16 44	2727	93 40 41	2716	92 4 23	2706
6	Regulus W.	84 2 23	2330	85 47 39	2320	87 33 9	2310	89 18 53	2300
	Spica W.	30 49 51	2456	32 32 6	2435	34 14 51	2416	35 58 3	2397
	VENUS E.	37 7 51	2647	35 29 59	2637	33 51 54	2627	32 13 35	2617
	SUN E.	83 59 20	2653	82 21 37	2642	80 43 39	2632	79 5 27	2621
7	Regulus W.	98 11 4	2255	99 58 10	2246	101 45 29	2237	103 33 1	2229
	Spica W.	44 40 10	2322	46 25 38	2309	48 11 25	2296	49 57 30	2285
	VENUS E.	23 58 43	2570	22 19 7	2561	20 39 19	2553	18 59 19	2545
	SUN E.	70 51 1	2572	69 11 28	2563	67 31 42	2554	65 51 44	2545
8	Regulus W.	112 33 38	2192	114 22 18	2185	116 11 8	2179	118 0 8	2173
	Spica W.	58 51 50	2236	60 39 24	2227	62 27 11	2219	64 15 10	2218
	MARS W.	19 32 20	2448	21 14 47	2429	22 57 40	2413	24 40 56	2399

GREENWICH MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
1	Aldebaran W.	103 33 28	2669	105 10 50	2660	106 48 24	2652	108 26 9	2643
	JUPITER W.	79 50 9	2647	81 28 0	2638	83 6 3	2630	84 44 17	2622
	Pollux W.	59 34 54	2719	61 11 9	2709	62 47 37	2698	64 24 19	2688
	Regulus W.	23 27 27	2682	25 4 31	2671	26 41 50	2661	28 19 22	2651
	Spica E.	31 21 55	2806	29 47 34	2812	28 13 22	2820	26 39 21	2831
	MARS E.	66 15 50	2881	64 43 7	2872	63 10 12	2863	61 37 6	2855
	Antares E.	77 6 45	2722	75 30 35	2715	73 54 15	2707	72 17 44	2699
	VENUS E.	93 23 42	2999	91 53 28	2991	90 23 4	2982	88 52 29	2973
2	Aldebaran W.	116 37 51	2599	118 16 47	2590	119 55 56	2581	121 35 17	2572
	JUPITER W.	92 58 22	2578	94 37 47	2569	96 17 24	2561	97 57 13	2552
	Pollux W.	72 31 8	2640	74 9 9	2630	75 47 23	2620	77 25 50	2610
	Regulus W.	36 30 17	2604	38 9 7	2595	39 48 9	2585	41 27 25	2576
	MARS E.	53 48 48	2811	52 14 34	2802	50 40 9	2793	49 5 32	2784
	Antares E.	64 12 40	2663	62 35 10	2656	60 57 31	2649	59 19 42	2642
	VENUS E.	81 16 41	2927	79 44 57	2918	78 13 1	2909	76 40 54	2899
	SUN E.	128 1 10	2944	126 29 47	2935	124 58 12	2925	123 26 25	2915
3	JUPITER W.	106 19 23	2507	108 0 27	2497	109 41 44	2488	111 23 14	2480
	Pollux W.	85 41 24	2563	87 21 10	2553	89 1 9	2544	90 41 21	2534
	Regulus W.	49 46 56	2528	51 27 30	2518	53 8 18	2509	54 49 19	2499
	MARS E.	41 9 38	2742	39 33 53	2734	37 57 58	2725	36 21 51	2717
	Antares E.	51 8 28	2612	49 29 49	2607	47 51 4	2603	46 12 13	2599
	VENUS E.	68 57 12	2851	67 23 50	2841	65 50 16	2831	64 16 28	2821
	SUN E.	115 44 18	2865	114 11 14	2854	112 37 56	2844	111 4 25	2834
4	Pollux W.	99 5 44	2487	100 47 16	2477	102 29 2	2467	104 11 1	2458
	Regulus W.	63 17 51	2450	65 0 15	2440	66 42 53	2430	68 25 45	2420
	MARS E.	28 18 47	2684	26 41 45	2679	25 4 36	2675	23 27 22	2671
	Antares E.	37 56 56	2593	36 17 51	2594	34 38 48	2596	32 59 48	2600
	VENUS E.	56 24 16	2771	54 49 10	2760	53 13 50	2750	51 38 16	2739
	SUN E.	103 13 29	2781	101 38 36	2770	100 3 29	2760	98 28 8	2749
5	Pollux W.	112 44 11	2413	114 27 27	2405	116 10 55	2396	117 54 36	2387
	Regulus W.	77 3 43	2370	78 48 1	2360	80 32 34	2350	82 17 21	2340
	Spica W.	24 7 9	2571	25 46 44	2537	27 27 6	2507	29 8 10	2480
	VENUS E.	43 37 0	2688	42 0 3	2678	40 22 53	2667	38 45 29	2657
	SUN E.	90 27 51	2695	88 51 5	2684	87 14 4	2674	85 36 49	2663
6	Regulus W.	91 4 52	2291	92 51 5	2282	94 37 31	2273	96 24 11	2264
	Spica W.	37 41 42	2380	39 25 46	2364	41 10 12	2349	42 55 1	2335
	VENUS E.	30 35 3	2607	28 56 18	2597	27 17 19	2588	25 38 7	2579
	SUN E.	77 27 1	2611	75 48 21	2601	74 9 28	2591	72 30 21	2582
7	Regulus W.	105 20 45	2221	107 8 41	2213	108 56 49	2206	110 45 8	2199
	Spica W.	51 43 51	2274	53 30 28	2264	55 17 21	2254	57 4 29	2245
	VENUS E.	17 19 8	2538	15 38 48	2531	13 58 19	2525	12 17 41	2519
	SUN E.	64 11 33	2536	62 31 10	2528	60 50 35	2520	59 9 49	2512
8	Regulus W.	119 49 16	2168	121 38 33	2165	123 27 57	2158	125 17 28	2154
	Spica W.	66 3 19	2206	67 51 38	2199	69 40 7	2193	71 28 45	2188
	MARS W.	26 24 32	2388	28 8 25	2378	29 52 32	2368	31 36 53	2359

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
8	SUN E.	57 28 53	2504	55 47 46	2498	54 6 30	2491	52 25 4	2485
9	Spica W.	73 17 30	2184	75 6 22	2180	76 55 21	2176	78 44 25	2173
	MARS W.	33 21 27	2352	35 6 11	2346	36 51 4	2341	38 36 5	2336
	SUN E.	43 55 56	2460	42 13 47	2457	40 31 33	2454	38 49 15	2452
14	SUN W.	23 19 57	2755	24 55 24	2770	26 30 32	2786	28 5 19	2802
	Aldebaran E.	80 28 54	2412	78 45 36	2428	77 2 41	2444	75 20 9	2460
	JUPITER E.	103 28 45	2404	101 45 16	2420	100 2 10	2436	98 19 26	2453
	Pollux E.	124 24 20	2467	122 42 20	2480	121 0 39	2494	119 19 17	2509
15	SUN W.	35 53 43	2889	37 26 16	2906	38 58 27	2924	40 30 16	2942
	Aldebaran E.	66 53 12	2543	65 12 58	2560	63 33 8	2576	61 53 40	2593
	JUPITER E.	89 51 37	2535	88 11 13	2552	86 31 13	2569	84 51 35	2586
	Pollux E.	110 57 39	2585	109 18 24	2601	107 39 30	2617	106 0 58	2633
16	SUN W.	48 3 39	3032	49 33 12	3049	51 2 24	3066	52 31 15	3084
	Aldebaran E.	53 42 9	2678	52 4 59	2694	50 28 11	2710	48 51 45	2726
	JUPITER E.	76 39 17	2671	75 1 58	2687	73 25 1	2704	71 48 26	2720
	Pollux E.	97 53 48	2715	96 17 28	2731	94 41 29	2747	93 5 51	2763
17	SUN W.	59 50 13	3168	61 17 1	3184	62 43 29	3199	64 9 39	3215
	Aldebaran E.	40 54 52	2805	39 20 30	2820	37 46 28	2834	36 12 45	2848
	JUPITER E.	63 50 52	2799	62 16 23	2814	60 42 14	2829	59 8 24	2843
	Pollux E.	85 12 55	2841	83 39 20	2856	82 6 5	2870	80 33 8	2885
	Regulus E.	121 3 24	2805	119 29 3	2820	117 55 1	2835	116 21 18	2848
18	SUN W.	71 16 2	3286	72 40 30	3299	74 4 42	3312	75 28 40	3324
	Aldebaran E.	28 28 38	2916	26 56 40	2929	25 24 58	2941	23 53 31	2953
	JUPITER E.	51 23 44	2911	49 51 39	2924	48 19 50	2936	46 48 17	2947
	Pollux E.	72 52 56	2954	71 21 46	2966	69 50 51	2978	68 20 11	2991
	Regulus E.	108 37 6	2914	107 5 5	2926	105 33 20	2937	104 1 49	2948
19	SUN W.	82 25 6	3378	83 47 47	3387	85 10 17	3396	86 32 38	3405
	JUPITER E.	39 14 3	3001	37 43 52	3010	36 13 52	3020	34 44 4	3029
	Pollux E.	60 50 33	3047	59 21 18	3057	57 52 16	3066	56 23 25	3076
	Regulus E.	96 27 32	2998	94 57 17	3006	93 27 13	3014	91 57 18	3022
20	SUN W.	93 22 10	3439	94 43 42	3444	96 5 9	3448	97 26 31	3452
	$\alpha$ Arietis W.	31 9 47	3667	32 27 9	3623	33 45 18	3586	35 4 8	3552
	JUPITER E.	27 17 41	3069	25 48 54	3077	24 20 17	3084	22 51 48	3092
	Pollux E.	49 2 0	3119	47 34 14	3127	46 6 38	3135	44 39 11	3143
	Regulus E.	84 29 54	3053	83 0 47	3058	81 31 46	3062	80 2 50	3065
21	SUN W.	104 12 22	3465	105 33 25	3466	106 54 26	3467	108 15 27	3467
	$\alpha$ Arietis W.	41 46 24	3430	43 8 7	3411	44 30 11	3394	45 52 34	3378
	Pollux E.	37 24 20	3183	35 57 51	3192	34 31 32	3201	33 5 24	3211
	Regulus E.	72 39 6	3077	71 10 28	3078	69 41 52	3078	68 13 16	3078
	Spica E.	126 17 51	3127	124 50 14	3126	123 22 36	3124	121 54 56	3123
22	SUN W.	115 0 45	3459	116 21 55	3456	117 43 7	3453	119 4 24	3449
	$\alpha$ Arietis W.	52 48 42	3312	54 12 40	3300	55 36 51	3288	57 1 16	3277

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
8	SUN	E.	50 43 30	2479	49 1 47	2474	47 19 57	2469	45 38 0	2464
9	Spica	W.	80 33 34	2170	82 22 46	2169	84 12 1	2167	86 1 19	2166
	MARS	W.	40 21 12	2332	42 6 25	2328	43 51 43	2326	45 37 4	2324
	SUN	E.	37 6 53	2450	35 24 29	2449	33 42 3	2448	31 59 36	2448
14	SUN	W.	29 39 44	2819	31 13 47	2836	32 47 28	2833	34 20 47	2871
	Aldebaran	E.	73 37 59	2477	71 56 13	2493	70 14 50	2509	68 33 49	2526
	JUPITER	E.	96 37 6	2469	94 55 9	2485	93 13 35	2502	91 32 24	2519
	Pollux	E.	117 38 16	2524	115 57 35	2539	114 17 16	2554	112 37 17	2569
15	SUN	W.	42 1 42	2960	43 32 45	2978	45 3 25	2996	46 33 43	3014
	Aldebaran	E.	60 14 36	2610	58 35 55	2627	56 57 37	2644	55 19 42	2661
	JUPITER	E.	83 12 21	2604	81 33 31	2621	79 55 4	2637	78 16 59	2654
	Pollux	E.	104 22 48	2650	102 45 1	2666	101 7 35	2682	99 30 31	2698
16	SUN	W.	53 59 44	3101	55 27 52	3119	56 55 39	3135	58 23 6	3152
	Aldebaran	E.	47 15 40	2743	45 39 57	2759	44 4 35	2774	42 29 33	2790
	JUPITER	E.	70 12 13	2736	68 36 21	2752	67 0 57	2768	65 25 41	2784
	Pollux	E.	91 30 35	2779	89 55 40	2795	88 21 5	2810	86 46 50	2825
17	SUN	W.	65 35 30	3230	67 1 3	3245	68 26 19	3259	69 51 19	3273
	Aldebaran	E.	34 39 20	2862	33 6 14	2876	31 33 25	2890	30 0 53	2903
	JUPITER	E.	57 34 52	2857	56 1 39	2871	54 28 43	2885	52 56 5	2898
	Pollux	E.	79 0 30	2899	77 28 10	2913	75 56 8	2927	74 24 23	2941
	Regulus	E.	114 47 53	2862	113 14 46	2876	111 41 56	2889	110 9 23	2901
18	SUN	W.	76 52 23	3336	78 15 53	3347	79 39 9	3358	81 2 13	3368
	Aldebaran	E.	22 22 19	2965	20 51 22	2976	19 20 40	2987	17 50 11	2998
	JUPITER	E.	45 16 58	2959	43 45 54	2970	42 15 4	2981	40 44 27	2991
	Pollux	E.	66 49 47	3003	65 19 38	3014	63 49 43	3025	62 20 1	3036
	Regulus	E.	102 30 31	2959	100 59 27	2970	99 28 37	2980	97 57 59	2989
19	SUN	W.	87 54 49	3413	89 16 51	3420	90 38 45	3427	92 0 31	3433
	JUPITER	E.	33 14 27	3037	31 45 0	3046	30 15 44	3054	28 46 38	3061
	Pollux	E.	54 54 46	3085	53 26 18	3094	51 58 2	3103	50 29 56	3111
	Regulus	E.	90 27 33	3029	88 57 57	3036	87 28 29	3042	85 59 8	3047
20	SUN	W.	98 47 48	3456	100 9 1	3459	101 30 10	3461	102 51 17	3463
	α Arietis	W.	36 23 35	3522	37 43 36	3495	39 4 6	3471	40 25 3	3449
	JUPITER	E.	21 23 29	3101	19 55 20	3110	18 27 23	3120	16 59 38	3132
	Pollux	E.	43 11 54	3151	41 44 46	3159	40 17 48	3167	38 50 59	3175
	Regulus	E.	78 33 58	3068	77 5 11	3071	75 36 27	3073	74 7 45	3075
21	SUN	W.	109 36 28	3466	110 57 30	3465	112 18 33	3463	113 39 38	3461
	α Arietis	W.	47 15 16	3364	48 38 14	3350	50 1 28	3337	51 24 58	3344
	Pollux	E.	31 39 28	3223	30 13 45	3236	28 48 18	3250	27 23 8	3266
	Regulus	E.	66 44 40	3078	65 16 3	3077	63 47 25	3075	62 18 45	3073
	Spica	E.	120 27 14	3121	118 59 30	3119	117 31 43	3116	116 3 52	3113
22	SUN	W.	120 25 45	3445	121 47 11	3440	123 8 42	3435	124 30 19	3431
	α Arietis	W.	58 25 55	3266	59 50 46	3255	61 15 50	3244	62 41 7	3234

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
22	Aldebaran W.	19 23 54	3076	20 52 33	3073	22 21 16	3069	23 50 4	3064
	Regulus E.	60 50 2	3071	59 21 17	3068	57 52 28	3065	56 23 36	3061
	Spica E.	114 35 58	3110	113 8 0	3106	111 39 57	3101	110 11 48	3097
23	α Arietis W.	64 6 36	3224	65 32 17	3213	66 58 11	3203	68 24 17	3192
	Aldebaran W.	31 15 34	3037	32 45 1	3031	34 14 35	3024	35 44 18	3017
	Regulus E.	48 57 58	3038	47 28 32	3032	45 58 59	3026	44 29 18	3019
	Spica E.	102 49 38	3069	101 20 51	3063	99 51 57	3056	98 22 54	3050
24	α Arietis W.	75 37 55	3140	77 5 16	3129	78 32 50	3119	80 0 36	3109
	Aldebaran W.	43 15 6	2979	44 45 45	2970	46 16 35	2961	47 47 36	2952
	JUPITER W.	20 36 29	3013	22 6 26	3000	23 36 39	2988	25 7 8	2976
	Regulus E.	36 58 47	2983	35 28 13	2975	33 57 29	2967	32 26 35	2959
	Spica E.	90 55 25	3011	89 25 26	3002	87 55 16	2993	86 24 55	2985
25	α Arietis W.	87 22 37	3057	88 51 39	3047	90 20 54	3036	91 50 22	3026
	Aldebaran W.	55 25 38	2904	56 57 51	2894	58 30 17	2884	60 2 56	2874
	JUPITER W.	32 43 9	2919	34 15 3	2908	35 47 12	2897	37 19 35	2886
	Regulus E.	24 49 27	2917	23 17 30	2909	21 45 22	2901	20 13 3	2893
	Spica E.	78 50 24	2939	77 18 55	2929	75 47 13	2919	74 15 19	2909
	Antares E.	124 37 52	2977	123 7 11	2965	121 36 14	2952	120 5 1	2939
26	α Arietis W.	99 20 44	2978	100 51 24	2969	102 22 16	2960	103 53 19	2951
	Aldebaran W.	67 49 35	2821	69 23 36	2810	70 57 51	2799	72 32 21	2788
	JUPITER W.	45 5 6	2830	46 38 55	2818	48 12 59	2807	49 47 18	2796
	Pollux W.	24 40 28	3034	26 9 58	3001	27 40 9	2971	29 10 58	2944
	Spica E.	66 32 40	2860	64 59 30	2851	63 26 8	2841	61 52 33	2831
	Antares E.	112 25 1	2878	110 52 14	2866	109 19 12	2854	107 45 54	2842
	MARS E.	115 57 50	3026	114 28 10	3015	112 58 16	3003	111 28 7	2992
27	α Arietis W.	111 31 12	2913	113 3 15	2906	114 35 26	2900	116 7 45	2895
	Aldebaran W.	80 28 23	2733	82 4 18	2722	83 40 28	2712	85 16 52	2701
	JUPITER W.	57 42 28	2741	59 18 13	2730	60 54 13	2719	62 30 27	2708
	Pollux W.	36 52 49	2836	38 26 30	2818	40 0 35	2801	41 35 2	2785
	Spica E.	54 1 36	2785	52 26 49	2777	50 51 51	2769	49 16 43	2761
	Antares E.	99 55 37	2785	98 20 49	2773	96 45 46	2762	95 10 28	2751
	MARS E.	103 53 45	2934	102 22 9	2922	100 50 18	2911	99 18 13	2899
28	Aldebaran W.	93 22 26	2649	95 0 14	2639	96 38 16	2629	98 16 32	2619
	JUPITER W.	70 35 12	2657	72 12 50	2646	73 50 42	2636	75 28 48	2626
	Pollux W.	49 32 19	2713	51 8 42	2700	52 45 23	2687	54 22 21	2675
	Regulus W.	13 19 19	2685	14 56 19	2669	16 33 41	2654	18 11 23	2639
	Spica E.	41 18 37	2730	39 42 36	2726	38 6 30	2722	36 30 19	2719
	Antares E.	87 10 26	2699	85 33 44	2689	83 56 49	2679	82 19 41	2669
	MARS E.	91 34 12	2844	90 0 41	2834	88 26 57	2823	86 52 59	2812

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup> , <sup>s</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
22	Aldebaran W.	° ' " 25 18 58	3059	° ' " 26 47 57	3054	° ' " 28 17 3	3049	° ' " 29 46 15	3043
	Regulus E.	54 54 39	3057	53 25 37	3053	51 56 30	3048	50 27 17	3043
	Spica E.	108 43 35	3098	107 15 16	3087	105 46 50	3081	104 18 17	3075
23	α Arietis W.	69 50 36	3182	71 17 7	3172	72 43 50	3161	74 10 46	3150
	Aldebaran W.	37 14 9	3010	38 44 9	3003	40 14 18	2995	41 44 37	2987
	Regulus E.	42 59 29	3012	41 29 32	3005	39 59 26	2998	38 29 11	2991
	Spica E.	96 53 43	3043	95 24 23	3035	93 54 53	3027	92 25 14	3019
24	α Arietis W.	81 28 35	3099	82 56 46	3088	84 25 10	3078	85 53 47	3067
	Aldebaran W.	49 18 49	2943	50 50 13	2934	52 21 49	2924	53 53 37	2914
	JUPITER W.	26 37 51	2964	28 8 49	2953	29 40 1	2941	31 11 28	2930
	Regulus E.	30 55 31	2950	29 24 16	2942	27 52 51	2933	26 21 14	2925
	Spica E.	84 54 24	2976	83 23 42	2967	81 52 48	2958	80 21 42	2948
25	α Arietis W.	93 20 2	3016	94 49 54	3006	96 19 59	2997	97 50 16	2988
	Aldebaran W.	61 35 49	2863	63 8 55	2853	64 42 14	2842	66 15 48	2831
	JUPITER W.	38 52 13	2875	40 25 4	2863	41 58 10	2852	43 31 31	2841
	Regulus E.	18 40 34	2886	17 7 57	2880	15 35 13	2876	14 2 23	2873
	Spica E.	72 43 12	2900	71 10 53	2890	69 38 21	2880	68 5 37	2870
	Antares E.	118 33 32	2927	117 1 48	2915	115 29 48	2903	113 57 32	2891
26	α Arietis W.	105 24 33	2943	106 55 58	2935	108 27 33	2927	109 59 18	2920
	Aldebaran W.	74 7 5	2777	75 42 3	2766	77 17 15	2755	78 52 42	2744
	JUPITER W.	51 21 51	2785	52 56 38	2774	54 31 40	2763	56 6 57	2752
	Pollux W.	30 42 22	2919	32 14 17	2896	33 46 41	2875	35 19 32	2855
	Spica E.	60 18 46	2822	58 44 47	2812	57 10 35	2803	55 36 11	2794
	Antares E.	106 12 21	2830	104 38 33	2818	103 4 29	2807	101 30 10	2796
	MARS E.	109 57 44	2980	108 27 6	2969	106 56 14	2957	105 25 7	2945
27	α Arietis W.	117 40 10	2890	119 12 42	2886	120 45 19	2883	122 18 0	2880
	Aldebaran W.	86 53 31	2691	88 30 23	2680	90 7 30	2669	91 44 51	2659
	JUPITER W.	64 6 56	2698	65 43 39	2687	67 20 36	2677	68 57 47	2667
	Pollux W.	43 9 50	2769	44 44 58	2754	46 20 26	2740	47 56 13	2726
	Spica E.	47 41 24	2754	46 5 55	2747	44 30 17	2741	42 54 31	2735
	Antares E.	93 34 56	2740	91 59 10	2729	90 23 9	2719	88 46 54	2709
	MARS E.	97 45 53	2888	96 13 19	2877	94 40 31	2866	93 7 29	2855
28	Aldebaran W.	99 55 1	2609	101 33 43	2599	103 12 39	2590	104 51 47	2581
	JUPITER W.	77 7 7	2616	78 45 40	2607	80 24 25	2598	82 3 23	2589
	Pollux W.	55 59 35	2663	57 37 5	2651	59 14 51	2640	60 52 53	2629
	Regulus W.	19 49 25	2626	21 27 45	2614	23 6 21	2603	24 45 12	2592
	Spica E.	34 54 4	2718	33 17 48	2719	31 41 33	2721	30 5 21	2724
	Antares E.	80 42 20	2660	79 4 47	2651	77 27 2	2642	75 49 4	2634
	MARS E.	85 18 47	2802	83 44 22	2792	82 9 44	2782	80 34 53	2773

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ' "	"	' "	s	m s	s
Frid.	1	22 45 17.31	9.379	S. 7 54 30.4	+ 56.72	16 10.24	65.47	12 41.42	0.476
Sat.	2	22 49 2.13	9.357	7 31 45.8	57.00	16 10.00	65.39	12 29.73	0.498
SUN.	3	22 52 46.46	9.337	7 8 54.8	57.26	16 9.75	65.32	12 17.54	0.518
Mon.	4	22 56 30.32	9.318	6 45 57.7	+ 57.51	16 9.50	65.25	12 4.87	0.537
Tues.	5	23 0 13.71	9.299	6 22 54.8	57.74	16 9.24	65.19	11 51.75	0.556
Wed.	6	23 3 56.68	9.282	5 59 46.6	57.95	16 8.98	65.13	11 38.20	0.573
Thur.	7	23 7 39.23	9.265	5 36 33.3	+ 58.15	16 8.72	65.07	11 24.24	0.590
Frid.	8	23 11 21.39	9.249	5 13 15.4	58.33	16 8.46	65.01	11 9.89	0.606
Sat.	9	23 15 3.16	9.233	4 49 53.3	58.51	16 8.20	64.95	10 55.15	0.621
SUN.	10	23 18 44.59	9.218	4 26 27.3	+ 58.65	16 7.94	64.89	10 40.07	0.636
Mon.	11	23 22 25.68	9.205	4 2 58.0	58.79	16 7.67	64.84	10 24.65	0.649
Tues.	12	23 26 6.45	9.191	3 39 25.5	58.91	16 7.41	64.79	10 8.90	0.662
Wed.	13	23 29 46.90	9.179	3 15 50.4	+ 59.01	16 7.14	64.74	9 52.85	0.675
Thur.	14	23 33 27.07	9.167	2 52 13.0	59.10	16 6.88	64.70	9 36.51	0.687
Frid.	15	23 37 6.96	9.156	2 28 33.7	59.17	16 6.61	64.66	9 19.90	0.698
Sat.	16	23 40 46.58	9.146	2 4 53.0	+ 59.22	16 6.35	64.62	9 3.03	0.708
SUN.	17	23 44 25.98	9.137	1 41 11.2	59.26	16 6.08	64.59	8 45.91	0.718
Mon.	18	23 48 5.16	9.128	1 17 28.7	59.28	16 5.82	64.56	8 28.58	0.727
Tues.	19	23 51 44.13	9.120	0 53 45.8	+ 59.28	16 5.55	64.54	8 11.05	0.735
Wed.	20	23 55 22.90	9.113	0 30 3.1	59.27	16 5.29	64.52	7 53.32	0.742
Thur.	21	23 59 1.51	9.106	S. 0 6 20.7	59.25	16 5.02	64.50	7 35.42	0.749
Frid.	22	0 2 39.98	9.100	N. 0 17 20.9	+ 59.21	16 4.75	64.48	7 17.38	0.754
Sat.	23	0 6 18.32	9.095	0 41 1.3	59.15	16 4.48	64.46	6 59.21	0.759
SUN.	24	0 9 56.56	9.091	1 4 40.2	59.08	16 4.21	64.45	6 40.94	0.763
Mon.	25	0 13 34.71	9.088	1 28 17.2	+ 59.00	16 3.94	64.44	6 22.59	0.766
Tues.	26	0 17 12.80	9.086	1 51 52.0	58.90	16 3.67	64.43	6 4.19	0.768
Wed.	27	0 20 50.84	9.085	2 15 24.0	58.78	16 3.39	64.43	5 45.74	0.769
Thur.	28	0 24 28.87	9.085	2 38 53.3	+ 58.66	16 3.12	64.43	5 27.28	0.769
Frid.	29	0 28 6.91	9.086	3 2 19.3	58.52	16 2.84	64.44	5 8.82	0.768
Sat.	30	0 31 44.99	9.088	3 25 41.7	58.36	16 2.56	64.44	4 50.38	0.767
SUN.	31	0 35 23.12	9.090	3 49 0.3	58.19	16 2.28	64.45	4 32.01	0.764
Mon.	32	0 39 1.33	9.094	N. 4 12 14.5	+ 58.00	16 2.00	64.46	4 13.72	0.760

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.18 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations increasing.



## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Frid.	1	22 45 15.32	9.380	S. 7 54 42.5	+56.72	12 41.52	0.476	22 32 33.80
Sat.	2	22 49 0.18	9.359	7 31 57.8	57.00	12 29.83	0.498	22 36 30.35
SUN.	3	22 52 44.55	9.339	7 9 6.6	57.27	12 17.65	0.518	22 40 26.90
Mon.	4	22 56 28.44	9.321	6 46 9.3	+57.52	12 4.98	0.537	22 44 23.46
Tues.	5	23 0 11.87	9.302	6 23 6.2	57.75	11 51.86	0.556	22 48 20.01
Wed.	6	23 3 54.87	9.284	5 59 57.8	57.96	11 38.31	0.573	22 52 16.56
Thur.	7	23 7 37.46	9.267	5 36 44.4	+58.16	11 24.35	0.590	22 56 13.11
Frid.	8	23 11 19.66	9.251	5 13 26.3	58.34	11 10.00	0.606	23 0 9.66
Sat.	9	23 15 1.48	9.235	4 50 4.0	58.51	10 55.26	0.621	23 4 6.22
SUN.	10	23 18 42.95	9.221	4 26 37.8	+58.66	10 40.18	0.636	23 8 2.77
Mon.	11	23 22 24.08	9.207	4 3 8.2	58.79	10 24.76	0.649	23 11 59.32
Tues.	12	23 26 4.89	9.19	3 39 35.5	58.90	10 9.01	0.662	23 15 55.88
Wed.	13	23 29 45.39	9.18	3 16 0.1	+59.00	9 52.96	0.675	23 19 52.43
Thur.	14	23 33 25.60	9.165	2 52 22.5	59.10	9 36.62	0.687	23 23 48.98
Frid.	15	23 37 5.54	9.158	2 28 42.9	59.18	9 20.01	0.698	23 27 45.53
Sat.	16	23 40 45.20	9.148	2 5 1.9	+59.23	9 3.12	0.708	23 31 42.08
SUN.	17	23 44 24.65	9.139	1 41 19.8	59.27	8 46.01	0.718	23 35 38.64
Mon.	18	23 48 3.87	9.130	1 17 37.0	59.29	8 28.68	0.727	23 39 35.19
Tues.	19	23 51 42.87	9.122	0 53 53.8	+59.29	8 11.13	0.735	23 43 31.74
Wed.	20	23 55 21.70	9.114	0 30 10.8	59.28	7 53.41	0.742	23 47 28.29
Thur.	21	23 59 0.36	9.108	S. 0 6 28.1	59.26	7 35.51	0.749	23 51 24.85
Frid.	22	0 2 38.87	9.102	N. 0 17 13.8	+59.22	7 17.47	0.754	23 55 21.40
Sat.	23	0 6 17.25	9.097	0 40 54.5	59.16	6 59.30	0.759	23 59 17.95
SUN.	24	0 9 55.54	9.093	1 4 33.7	59.09	6 41.04	0.763	0 3 14.50
Mon.	25	0 13 33.73	9.090	1 28 11.0	+59.01	6 22.67	0.766	0 7 11.06
Tues.	26	0 17 11.87	9.088	1 51 46.1	58.91	6 4.26	0.768	0 11 7.61
Wed.	27	0 20 49.97	9.087	2 15 18.6	58.79	5 45.81	0.769	0 15 4.16
Thur.	28	0 24 28.05	9.087	2 38 48.1	+58.67	5 27.34	0.769	0 19 0.71
Frid.	29	0 28 6.14	9.088	3 2 14.4	58.53	5 8.88	0.768	0 22 57.26
Sat.	30	0 31 44.26	9.089	3 25 37.1	58.37	4 50.44	0.767	0 26 53.82
SUN.	31	0 35 22.44	9.092	3 48 56.0	58.20	4 32.07	0.764	0 30 50.37
Mon.	32	0 39 0.69	9.096	N. 4 12 10.5	+58.01	4 13.77	0.760	0 34 46.92

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
 The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

Diff. for 1 Hour,  
 +9°.8565.  
 (Table III.)

## AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	60	339 46 7.8	46 13.8	150.46	+ 0.83	9.996 0713	+ 45.2	h m s 1 27 11.88
2	61	340 46 18.0	46 23.9	150.39	0.89	9.996 1806	45.9	1 23 15.97
3	62	341 46 26.6	46 32.3	150.32	0.92	9.996 2915	46.6	1 19 20.06
4	63	342 46 33.4	46 39.1	150.25	+ 0.93	9.996 4040	+ 47.2	1 15 24.16
5	64	343 46 38.7	46 44.3	150.18	0.90	9.996 5180	47.7	1 11 28.25
6	65	344 46 42.4	46 47.9	150.12	0.83	9.996 6331	48.2	1 7 32.34
7	66	345 46 44.6	46 50.0	150.06	+ 0.75	9.996 7494	+ 48.6	1 3 36.44
8	67	346 46 45.2	46 50.5	149.99	0.64	9.996 8665	49.0	0 59 40.53
9	68	347 46 44.1	46 49.4	149.93	0.52	9.996 9843	49.2	0 55 44.62
10	69	348 46 41.5	46 46.6	149.86	+ 0.38	9.997 1027	+ 49.4	0 51 48.72
11	70	349 46 37.2	46 42.2	149.79	0.24	9.997 2215	49.5	0 47 52.81
12	71	350 46 31.0	46 36.0	149.71	0.12	9.997 3405	49.6	0 43 56.90
13	72	351 46 23.1	46 28.0	149.63	+ 0.01	9.997 4596	+ 49.7	0 40 1.00
14	73	352 46 13.3	46 18.1	149.55	- 0.09	9.997 5788	49.7	0 36 5.09
15	74	353 46 1.5	46 6.2	149.47	0.16	9.997 6981	49.7	0 32 9.19
16	75	354 45 47.6	45 52.2	149.38	- 0.20	9.997 8174	+ 49.7	0 28 13.28
17	76	355 45 31.6	45 36.1	149.29	0.21	9.997 9368	49.8	0 24 17.37
18	77	356 45 13.4	45 17.8	149.20	0.19	9.998 0563	49.8	0 20 21.46
19	78	357 44 52.9	44 57.2	149.11	- 0.14	9.998 1759	+ 49.9	0 16 25.56
20	79	358 44 30.3	44 34.5	149.01	- 0.10	9.998 2958	50.0	0 12 29.65
21	80	359 44 5.4	44 9.5	148.92	0.00	9.998 4160	50.1	0 8 33.75
22	81	0 43 38.2	43 42.2	148.82	+ 0.11	9.998 5365	+ 50.3	0 4 37.84
23	82	1 43 8.6	43 12.6	148.73	0.22	9.998 6574	50.5	{ 0 0 41.93 23 56 46.03 }
24	83	2 42 36.8	42 40.7	148.63	0.35	9.998 7788	50.7	
25	84	3 42 2.7	42 6.5	148.54	+ 0.47	9.998 9008	+ 50.9	23 48 54.21
26	85	4 41 26.4	41 30.1	148.44	0.59	9.999 0232	51.2	23 44 58.30
27	86	5 40 47.8	40 51.4	148.35	0.69	9.999 1464	51.5	23 41 2.40
28	87	6 40 7.0	40 10.6	148.26	+ 0.77	9.999 2703	+ 51.8	23 37 6.49
29	88	7 39 24.1	39 27.6	148.17	0.83	9.999 3949	52.1	23 33 10.59
30	89	8 38 39.2	38 42.5	148.09	0.87	9.999 5202	52.4	23 29 14.68
31	90	9 37 52.2	37 55.5	148.00	0.89	9.999 6462	52.7	23 25 18.77
32	91	10 37 3.3	37 6.5	147.92	+ 0.87	9.999 7729	+ 52.9	23 21 22.87

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,  
— 9<sup>s</sup>.8296.  
(Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	' "	' "	' "	"	' "	"	h m	m	d
1	15 35.6	15 39.7	57 7.9	+ 1.28	57 22.9	+ 1.22	13 40.9	1.99	16.8
2	15 43.6	15 47.3	57 37.3	1.16	57 50.8	1.09	14 28.8	2.02	17.8
3	15 50.8	15 54.0	58 3.5	1.02	58 15.3	0.95	15 17.9	2.07	18.8
4	15 57.0	15 59.7	58 26.2	+ 0.87	58 36.2	+ 0.80	16 8.6	2.16	19.8
5	16 2.2	16 4.4	58 45.3	0.73	58 53.5	0.65	17 1.7	2.27	20.8
6	16 6.4	16 8.1	59 0.9	0.57	59 7.3	0.49	17 57.4	2.37	21.8
7	16 9.6	16 10.8	59 12.7	+ 0.40	59 17.0	+ 0.31	18 55.3	2.45	22.8
8	16 11.6	16 12.1	59 20.1	+ 0.20	59 21.9	+ 0.09	19 54.6	2.47	23.8
9	16 12.2	16 11.8	59 22.2	- 0.04	59 20.9	- 0.18	20 53.7	2.44	24.8
10	16 11.0	16 9.6	59 17.8	- 0.34	59 12.8	- 0.50	21 51.4	2.35	25.8
11	16 7.7	16 5.3	59 5.8	0.67	58 56.8	0.84	22 46.5	2.24	26.8
12	16 2.3	15 58.7	58 45.7	1.00	58 32.7	1.16	23 38.9	2.12	27.8
13	15 54.7	15 50.2	58 17.9	- 1.31	58 1.4	- 1.43	0	.	28.8
14	15 45.3	15 40.2	57 43.5	1.53	57 24.5	1.61	0 28.6	2.02	0.2
15	15 34.8	15 29.3	57 4.9	1.66	56 44.8	1.68	1 16.2	1.95	1.2
16	15 23.9	15 18.5	56 24.7	- 1.66	56 5.0	- 1.61	2 2.5	1.91	2.2
17	15 13.3	15 8.4	55 46.0	1.54	55 28.0	1.43	2 48.0	1.89	3.2
18	15 3.9	14 59.9	55 11.5	1.30	54 56.7	1.15	3 33.5	1.90	4.2
19	14 56.4	14 53.5	54 43.8	- 0.99	54 33.0	- 0.80	4 19.4	1.93	5.2
20	14 51.2	14 49.5	54 24.6	0.60	54 18.6	- 0.39	5 6.0	1.96	6.2
21	14 48.6	14 48.4	54 15.2	- 0.17	54 14.5	+ 0.03	5 53.5	2.00	7.2
22	14 48.9	14 50.1	54 16.3	+ 0.26	54 20.8	+ 0.48	6 41.8	2.02	8.2
23	14 52.0	14 54.6	54 27.8	0.68	54 37.3	0.89	7 30.6	2.04	9.2
24	14 57.8	15 1.6	54 49.1	- 1.07	55 3.0	1.24	8 19.4	2.04	10.2
25	15 6.0	15 10.7	55 18.9	+ 1.39	55 36.4	+ 1.52	9 8.2	2.02	11.2
26	15 15.8	15 21.3	55 55.2	1.62	56 15.2	1.69	9 56.6	2.01	12.2
27	15 26.9	15 32.6	56 35.8	1.73	56 56.6	1.73	10 44.8	2.00	13.2
28	15 38.2	15 43.7	57 17.4	+ 1.71	57 37.6	+ 1.65	11 32.9	2.01	14.2
29	15 49.0	15 53.9	57 57.0	1.56	58 15.1	1.44	12 21.5	2.04	15.2
30	15 58.4	16 2.5	58 31.7	1.30	58 46.4	1.14	13 11.2	2.10	16.2
31	16 5.9	16 8.8	58 59.1	0.96	59 9.6	0.78	14 2.6	2.19	17.2
32	16 11.0	16 12.6	59 17.8	+ 0.60	59 23.8	+ 0.41	14 56.3	2.29	18.2

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 1.					SUNDAY 3.				
0	11 47 9.98	2.0838	N. 5 52 49.6	11.529	0	13 27 56.60	2.1317	S. 3 45 8.4	12.148
1	11 49 15.01	2.0839	5 41 16.7	11.567	1	13 30 4.56	2.1338	3 57 16.9	12.135
2	11 51 20.05	2.0840	5 29 41.6	11.604	2	13 32 12.65	2.1359	4 9 24.6	12.120
3	11 53 25.09	2.0841	5 18 4.4	11.637	3	13 34 20.87	2.1381	4 21 31.3	12.103
4	11 55 30.14	2.0842	5 6 25.1	11.672	4	13 36 29.22	2.1403	4 33 37.0	12.087
5	11 57 35.20	2.0844	4 54 43.8	11.704	5	13 38 37.71	2.1426	4 45 41.7	12.069
6	11 59 40.27	2.0847	4 43 0.6	11.736	6	13 40 46.33	2.1448	4 57 45.3	12.050
7	12 1 45.36	2.0849	4 31 15.5	11.768	7	13 42 55.09	2.1472	5 9 47.7	12.029
8	12 3 50.46	2.0852	4 19 28.5	11.798	8	13 45 4.00	2.1497	5 21 48.8	12.007
9	12 5 55.58	2.0855	4 7 39.7	11.827	9	13 47 13.05	2.1521	5 33 48.6	11.985
10	12 8 0.72	2.0859	3 55 49.3	11.854	10	13 49 22.25	2.1546	5 45 47.0	11.961
11	12 10 5.89	2.0863	3 43 57.2	11.882	11	13 51 31.60	2.1572	5 57 43.9	11.936
12	12 12 11.08	2.0867	3 32 3.5	11.908	12	13 53 41.11	2.1597	6 9 39.3	11.910
13	12 14 16.30	2.0872	3 20 8.2	11.933	13	13 55 50.77	2.1623	6 21 33.1	11.882
14	12 16 21.55	2.0877	3 8 11.5	11.957	14	13 58 0.59	2.1650	6 33 25.2	11.853
15	12 18 26.83	2.0883	2 56 13.4	11.980	15	14 0 10.57	2.1677	6 45 15.5	11.823
16	12 20 32.15	2.0890	2 44 13.9	12.002	16	14 2 20.72	2.1706	6 57 4.0	11.792
17	12 22 37.51	2.0897	2 32 13.1	12.023	17	14 4 31.04	2.1734	7 8 50.6	11.761
18	12 24 42.91	2.0903	2 20 11.1	12.043	18	14 6 41.53	2.1762	7 20 35.3	11.727
19	12 26 48.35	2.0911	2 8 7.9	12.062	19	14 8 52.19	2.1792	7 32 17.9	11.692
20	12 28 53.84	2.0919	1 56 3.6	12.080	20	14 11 3.03	2.1821	7 43 58.4	11.657
21	12 30 59.37	2.0926	1 43 58.3	12.097	21	14 13 14.04	2.1850	7 55 36.7	11.620
22	12 33 4.95	2.0935	1 31 52.0	12.113	22	14 15 25.23	2.1880	8 7 12.8	11.582
23	12 35 10.59	2.0944	N. 1 19 44.7	12.128	23	14 17 36.60	2.1911	S. 8 18 46.5	11.542
SATURDAY 2.					MONDAY 4.				
0	12 37 16.28	2.0953	N. 1 7 36.6	12.142	0	14 19 48.16	2.1942	S. 8 30 17.9	11.502
1	12 39 22.03	2.0963	0 55 27.7	12.154	1	14 21 59.91	2.1973	8 41 46.8	11.461
2	12 41 27.84	2.0974	0 43 18.1	12.166	2	14 24 11.84	2.2005	8 53 13.2	11.418
3	12 43 33.72	2.0985	0 31 7.8	12.177	3	14 26 23.97	2.2037	9 4 37.0	11.374
4	12 45 39.66	2.0996	0 18 56.9	12.186	4	14 28 36.29	2.2070	9 15 58.1	11.328
5	12 47 45.67	2.1007	N. 0 6 45.5	12.194	5	14 30 48.81	2.2102	9 27 16.4	11.282
6	12 49 51.75	2.1020	S. 0 5 26.4	12.202	6	14 33 1.52	2.2136	9 38 31.9	11.234
7	12 51 57.91	2.1033	0 17 38.8	12.209	7	14 35 14.44	2.2170	9 49 44.5	11.186
8	12 54 4.15	2.1046	0 29 51.5	12.214	8	14 37 27.56	2.2203	10 0 54.2	11.136
9	12 56 10.46	2.1059	0 42 4.5	12.218	9	14 39 40.88	2.2237	10 12 0.8	11.084
10	12 58 16.86	2.1073	0 54 17.7	12.221	10	14 41 54.41	2.2272	10 23 4.3	11.032
11	13 0 23.34	2.1088	1 6 31.0	12.223	11	14 44 8.15	2.2307	10 34 4.6	10.978
12	13 2 29.91	2.1102	1 18 44.5	12.225	12	14 46 22.10	2.2343	10 45 1.7	10.923
13	13 4 36.57	2.1117	1 30 58.0	12.224	13	14 48 36.26	2.2378	10 55 55.4	10.867
14	13 6 43.32	2.1133	1 43 11.4	12.222	14	14 50 50.64	2.2415	11 6 45.7	10.810
15	13 8 50.17	2.1150	1 55 24.7	12.220	15	14 53 5.24	2.2452	11 17 32.6	10.752
16	13 10 57.12	2.1167	2 7 37.8	12.217	16	14 55 20.06	2.2487	11 28 15.9	10.692
17	13 13 4.17	2.1183	2 19 50.7	12.212	17	14 57 35.09	2.2524	11 38 55.6	10.631
18	13 15 11.32	2.1201	2 32 3.3	12.207	18	14 59 50.35	2.2562	11 49 31.6	10.568
19	13 17 18.58	2.1219	2 44 15.5	12.200	19	15 2 5.83	2.2599	12 0 3.8	10.505
20	13 19 25.95	2.1238	2 56 27.3	12.192	20	15 4 21.54	2.2637	12 10 32.2	10.441
21	13 21 33.44	2.1257	3 8 38.5	12.182	21	15 6 37.48	2.2675	12 20 56.7	10.375
22	13 23 41.04	2.1277	3 20 49.1	12.172	22	15 8 53.64	2.2713	12 31 17.2	10.307
23	13 25 48.76	2.1297	3 32 59.1	12.161	23	15 11 10.03	2.2752	12 41 33.6	10.239
24	13 27 56.60	2.1317	S. 3 45 8.4	12.148	24	15 13 26.66	2.2791	S. 12 51 45.9	10.170

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 5.					THURSDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	15 13 26.66	2.2791	S. 12 51 45.9	10.170	1	17 7 25.49	2.4660	S. 19 17 33.3	5.477
2	15 15 43.52	2.2829	13 1 54.0	10.099	2	17 9 53.55	2.4692	19 22 58.3	5.355
3	15 18 0.61	2.2868	13 11 57.8	10.027	3	17 12 21.80	2.4725	19 28 15.9	5.230
4	15 20 17.94	2.2907	13 21 57.3	9.955	4	17 14 50.25	2.4757	19 33 25.9	5.105
5	15 22 35.50	2.2947	13 31 52.4	9.880	5	17 17 18.88	2.4788	19 38 28.5	4.980
6	15 24 53.31	2.2987	13 41 42.9	9.804	6	17 19 47.71	2.4819	19 43 23.5	4.853
7	15 27 11.35	2.3027	13 51 28.9	9.728	7	17 22 16.71	2.4849	19 48 10.9	4.726
8	15 29 29.63	2.3067	14 1 10.3	9.650	8	17 24 45.90	2.4879	19 52 50.6	4.597
9	15 31 48.15	2.3107	14 10 46.9	9.571	9	17 27 15.26	2.4907	19 57 22.6	4.468
10	15 34 6.91	2.3147	14 20 18.8	9.491	10	17 29 44.79	2.4936	20 1 46.8	4.338
11	15 36 25.91	2.3187	14 29 45.8	9.409	11	17 32 14.49	2.4964	20 6 3.2	4.208
12	15 38 45.15	2.3227	14 39 7.9	9.327	12	17 34 44.36	2.4992	20 10 11.8	4.077
13	15 41 4.64	2.3268	14 48 25.0	9.242	13	17 37 14.39	2.5018	20 14 12.5	3.946
14	15 43 24.37	2.3309	14 57 37.0	9.157	14	17 39 44.58	2.5044	20 18 5.3	3.812
15	15 45 44.35	2.3350	15 6 43.9	9.070	15	17 42 14.92	2.5068	20 21 50.0	3.679
16	15 48 4.57	2.3390	15 15 45.6	8.983	16	17 44 45.40	2.5093	20 25 26.8	3.546
17	15 50 25.03	2.3431	15 24 42.0	8.895	17	17 47 16.03	2.5117	20 28 55.5	3.411
18	15 52 45.74	2.3472	15 33 33.0	8.806	18	17 49 46.80	2.5139	20 32 16.1	3.276
19	15 55 6.69	2.3512	15 42 18.6	8.714	19	17 52 17.70	2.5162	20 35 28.6	3.141
20	15 57 27.89	2.3553	15 50 58.7	8.622	20	17 54 48.74	2.5183	20 38 33.0	3.004
21	15 59 49.33	2.3593	15 59 33.3	8.529	21	17 57 19.90	2.5203	20 41 29.1	2.867
22	16 2 11.01	2.3634	16 8 2.2	8.434	22	17 59 51.18	2.5222	20 44 17.1	2.730
23	16 4 32.94	2.3675	16 16 25.4	8.339	23	18 2 22.57	2.5242	20 46 56.7	2.592
24	16 6 55.11	2.3715	S. 16 24 42.9	8.242	24	18 4 54.08	2.5260	S. 20 49 28.1	2.454
WEDNESDAY 6.					FRIDAY 8.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	16 9 17.52	2.3756	S. 16 32 54.5	8.144	1	18 7 25.69	2.5277	S. 20 51 51.2	2.316
2	16 11 40.18	2.3797	16 41 0.2	8.045	2	18 9 57.40	2.5294	20 54 6.0	2.177
3	16 14 3.08	2.3837	16 48 59.9	7.945	3	18 12 29.22	2.5310	20 56 12.4	2.037
4	16 16 26.22	2.3877	16 56 53.6	7.844	4	18 15 1.12	2.5323	20 58 10.4	1.897
5	16 18 49.60	2.3917	17 4 41.2	7.742	5	18 17 33.10	2.5337	21 0 0.0	1.757
6	16 21 13.22	2.3957	17 12 22.6	7.638	6	18 20 5.17	2.5351	21 1 41.2	1.616
7	16 23 37.08	2.3996	17 19 57.8	7.534	7	18 22 37.31	2.5362	21 3 13.9	1.475
8	16 26 1.17	2.4035	17 27 26.7	7.428	8	18 25 9.52	2.5374	21 4 38.2	1.334
9	16 28 25.50	2.4075	17 34 49.2	7.322	9	18 27 41.80	2.5385	21 5 54.0	1.192
10	16 30 50.07	2.4114	17 42 5.3	7.214	10	18 30 14.14	2.5394	21 7 1.3	1.050
11	16 33 14.87	2.4152	17 49 14.9	7.106	11	18 32 46.53	2.5402	21 8 0.0	0.908
12	16 35 39.90	2.4191	17 56 18.0	6.996	12	18 35 18.96	2.5409	21 8 50.3	0.767
13	16 38 5.16	2.4229	18 3 14.4	6.885	13	18 37 51.44	2.5417	21 9 32.0	0.624
14	16 40 30.65	2.4267	18 10 4.2	6.773	14	18 40 23.96	2.5422	21 10 5.2	0.482
15	16 42 56.36	2.4304	18 16 47.2	6.660	15	18 42 56.51	2.5427	21 10 29.8	0.339
16	16 45 22.30	2.4342	18 23 23.4	6.546	16	18 45 29.08	2.5430	21 10 45.9	0.197
17	16 47 48.46	2.4378	18 29 52.7	6.431	17	18 48 1.67	2.5433	21 10 53.4	-0.054
18	16 50 14.84	2.4415	18 36 15.1	6.315	18	18 50 34.28	2.5436	21 10 52.4	+0.089
19	16 52 41.44	2.4452	18 42 30.5	6.198	19	18 53 6.90	2.5437	21 10 42.7	0.232
20	16 55 8.26	2.4487	18 48 38.9	6.081	20	18 55 39.52	2.5436	21 10 24.5	0.375
21	16 57 35.29	2.4522	18 54 40.2	5.962	21	18 58 12.13	2.5435	21 9 57.7	0.517
22	17 0 2.53	2.4557	19 0 34.4	5.842	22	19 0 44.74	2.5434	21 9 22.4	0.660
23	17 2 29.98	2.4592	19 6 21.3	5.722	23	19 3 17.34	2.5431	21 8 38.5	0.803
24	17 4 57.63	2.4626	19 12 1.0	5.600	24	19 5 49.91	2.5427	21 7 46.0	0.946
	17 7 25.49	2.4660	S. 19 17 33.3	5.477		19 8 22.46	2.5422	S. 21 6 45.0	1.088

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 9.					MONDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	19 8 22.46	2.5422	S. 21 6 45.0	1.088	0	21 8 12.33	2.4222	S. 17 38 42.1	7.308
1	19 10 54.98	2.5417	21 5 35.4	1.230	1	21 10 37.54	2.4182	17 31 20.3	7.417
2	19 13 27.46	2.5410	21 4 17.4	1.372	2	21 13 2.51	2.4142	17 23 52.0	7.523
3	19 15 59.90	2.5402	21 2 50.8	1.515	3	21 15 27.24	2.4101	17 16 17.3	7.632
4	19 18 32.29	2.5394	21 1 15.6	1.657	4	21 17 51.72	2.4059	17 8 36.2	7.737
5	19 21 4.63	2.5385	20 59 32.0	1.797	5	21 20 15.95	2.4017	17 0 48.9	7.840
6	19 23 36.91	2.5374	20 57 40.0	1.937	6	21 22 39.92	2.3975	16 52 55.4	7.942
7	19 26 9.12	2.5363	20 55 39.5	2.079	7	21 25 3.65	2.3933	16 44 55.8	8.043
8	19 28 41.27	2.5352	20 53 30.5	2.220	8	21 27 27.12	2.3890	16 36 50.2	8.143
9	19 31 13.34	2.5338	20 51 13.1	2.360	9	21 29 50.33	2.3847	16 28 38.6	8.243
10	19 33 45.32	2.5323	20 48 47.3	2.499	10	21 32 13.29	2.3804	16 20 21.0	8.342
11	19 36 17.22	2.5309	20 46 13.2	2.638	11	21 34 35.98	2.3760	16 11 57.6	8.438
12	19 38 49.03	2.5293	20 43 30.7	2.778	12	21 36 58.41	2.3717	16 3 28.4	8.533
13	19 41 20.74	2.5277	20 40 39.8	2.917	13	21 39 20.58	2.3673	15 54 53.6	8.627
14	19 43 52.35	2.5259	20 37 40.7	3.054	14	21 41 42.49	2.3630	15 46 13.2	8.720
15	19 46 23.85	2.5240	20 34 33.3	3.192	15	21 44 4.14	2.3587	15 37 27.2	8.812
16	19 48 55.23	2.5221	20 31 17.7	3.328	16	21 46 25.53	2.3542	15 28 35.8	8.902
17	19 51 26.50	2.5201	20 27 53.9	3.465	17	21 48 46.64	2.3497	15 19 39.0	8.991
18	19 53 57.64	2.5179	20 24 21.9	3.601	18	21 51 7.49	2.3453	15 10 36.9	9.078
19	19 56 28.65	2.5157	20 20 41.8	3.736	19	21 53 28.08	2.3408	15 1 29.6	9.164
20	19 58 59.53	2.5136	20 16 53.6	3.870	20	21 55 48.39	2.3363	14 52 17.2	9.249
21	20 1 30.28	2.5113	20 12 57.4	4.004	21	21 58 8.44	2.3319	14 42 59.7	9.333
22	20 4 0.88	2.5088	20 8 53.1	4.138	22	22 0 28.22	2.3274	14 33 37.2	9.417
23	20 6 31.33	2.5062	S. 20 4 40.8	4.271	23	22 2 47.73	2.3229	S. 14 24 9.7	9.498
SUNDAY 10.					TUESDAY 12.				
0	20 9 1.63	2.5037	S. 20 0 20.6	4.402	0	22 5 6.97	2.3184	S. 14 14 37.4	9.577
1	20 11 31.77	2.5010	19 55 52.5	4.534	1	22 7 25.94	2.3140	14 5 0.4	9.656
2	20 14 1.75	2.4983	19 51 16.5	4.665	2	22 9 44.65	2.3095	13 55 18.7	9.733
3	20 16 31.57	2.4955	19 46 32.7	4.794	3	22 12 3.08	2.3050	13 45 32.4	9.810
4	20 19 1.21	2.4927	19 41 41.2	4.923	4	22 14 21.25	2.3006	13 35 41.5	9.885
5	20 21 30.68	2.4897	19 36 41.9	5.052	5	22 16 39.15	2.2961	13 25 46.2	9.958
6	20 23 59.97	2.4866	19 31 35.0	5.178	6	22 18 56.78	2.2916	13 15 46.6	10.029
7	20 26 29.07	2.4835	19 26 20.5	5.305	7	22 21 14.14	2.2872	13 5 42.7	10.100
8	20 28 57.99	2.4804	19 20 58.4	5.431	8	22 23 31.24	2.2827	12 55 34.6	10.170
9	20 31 26.72	2.4772	19 15 28.8	5.555	9	22 25 48.06	2.2782	12 45 22.3	10.238
10	20 33 55.26	2.4739	19 9 51.8	5.679	10	22 28 4.62	2.2738	12 35 6.0	10.304
11	20 36 23.59	2.4705	19 4 7.3	5.802	11	22 30 20.92	2.2694	12 24 45.8	10.370
12	20 38 51.72	2.4672	18 58 15.5	5.924	12	22 32 36.95	2.2650	12 14 21.6	10.434
13	20 41 19.65	2.4637	18 52 16.4	6.046	13	22 34 52.72	2.2606	12 3 53.7	10.497
14	20 43 47.36	2.4602	18 46 10.0	6.166	14	22 37 8.22	2.2562	11 53 22.0	10.558
15	20 46 14.87	2.4567	18 39 56.5	6.284	15	22 39 23.47	2.2519	11 42 46.7	10.618
16	20 48 42.16	2.4530	18 33 35.9	6.402	16	22 41 38.45	2.2475	11 32 7.8	10.677
17	20 51 9.23	2.4492	18 27 8.2	6.520	17	22 43 53.17	2.2432	11 21 25.5	10.734
18	20 53 36.07	2.4455	18 20 33.5	6.636	18	22 46 7.64	2.2389	11 10 39.7	10.791
19	20 56 2.69	2.4418	18 13 51.9	6.751	19	22 48 21.84	2.2346	10 59 50.6	10.846
20	20 58 29.09	2.4380	18 7 3.4	6.865	20	22 50 35.79	2.2303	10 48 58.2	10.899
21	21 0 55.25	2.4341	18 0 8.1	6.977	21	22 52 49.48	2.2261	10 38 2.7	10.951
22	21 3 21.18	2.4302	17 53 6.1	7.089	22	22 55 2.92	2.2219	10 27 4.1	11.002
23	21 5 46.87	2.4262	17 45 57.4	7.200	23	22 57 16.11	2.2177	10 16 2.5	11.052
24	21 8 12.33	2.4222	S. 17 38 42.1	7.308	24	22 59 29.05	2.2136	S. 10 4 57.9	11.100

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 13.					FRIDAY 15.				
0	22 59 29.05	2.2136	S. 10 4 57.9	11.100	0	0 41 35.22	2.0561	S. 0 40 17.5	11.977
1	23 1 41.74	2.2094	9 53 50.5	11.147	1	0 43 38.52	2.0538	0 28 19.1	11.968
2	23 3 54.18	2.2053	9 42 40.3	11.192	2	0 45 41.68	2.0517	0 16 21.3	11.958
3	23 6 6.38	2.2012	9 31 27.4	11.237	3	0 47 44.72	2.0496	S. 0 4 24.1	11.948
4	23 8 18.33	2.1972	9 20 11.9	11.279	4	0 49 47.63	2.0471	N. 0 7 32.4	11.935
5	23 10 30.04	2.1932	9 8 53.9	11.321	5	0 51 50.41	2.0453	0 19 28.1	11.922
6	23 12 41.51	2.1892	8 57 33.4	11.362	6	0 53 53.07	2.0434	0 31 23.0	11.908
7	23 14 52.75	2.1852	8 46 10.5	11.401	7	0 55 55.62	2.0414	0 43 17.1	11.894
8	23 17 3.74	2.1812	8 34 45.3	11.439	8	0 57 58.04	2.0394	0 55 10.3	11.878
9	23 19 14.50	2.1774	8 23 17.8	11.477	9	1 0 0.35	2.0376	1 7 2.5	11.861
10	23 21 25.03	2.1736	8 11 48.1	11.512	10	1 2 2.55	2.0357	1 18 53.6	11.842
11	23 23 35.33	2.1697	8 0 16.4	11.545	11	1 4 4.64	2.0339	1 30 43.6	11.824
12	23 25 45.39	2.1658	7 48 42.7	11.578	12	1 6 6.62	2.0322	1 42 32.5	11.805
13	23 27 55.23	2.1622	7 37 7.0	11.610	13	1 8 8.51	2.0306	1 54 20.2	11.784
14	23 30 4.85	2.1584	7 25 29.5	11.640	14	1 10 10.29	2.0289	2 6 6.6	11.762
15	23 32 14.24	2.1547	7 13 50.2	11.669	15	1 12 11.98	2.0273	2 17 51.7	11.741
16	23 34 23.42	2.1512	7 2 9.2	11.697	16	1 14 13.57	2.0257	2 29 35.5	11.717
17	23 36 32.38	2.1475	6 50 26.6	11.723	17	1 16 15.07	2.0242	2 41 17.8	11.692
18	23 38 41.12	2.1439	6 38 42.4	11.749	18	1 18 16.48	2.0227	2 52 58.7	11.668
19	23 40 49.65	2.1403	6 26 56.7	11.774	19	1 20 17.80	2.0213	3 4 38.0	11.642
20	23 42 57.96	2.1368	6 15 9.5	11.797	20	1 22 19.04	2.0200	3 16 15.8	11.617
21	23 45 6.07	2.1334	6 3 21.0	11.818	21	1 24 20.20	2.0187	3 27 52.0	11.589
22	23 47 13.97	2.1300	5 51 31.3	11.838	22	1 26 21.29	2.0174	3 39 26.5	11.560
23	23 49 21.67	2.1266	S. 5 39 40.4	11.858	23	1 28 22.29	2.0161	N. 3 50 59.2	11.530
THURSDAY 14.					SATURDAY 16.				
0	23 51 29.16	2.1232	S. 5 27 48.3	11.877	0	1 30 23.22	2.0149	N. 4 2 30.1	11.500
1	23 53 36.46	2.1200	5 15 55.2	11.893	1	1 32 24.08	2.0137	4 13 59.2	11.469
2	23 55 43.56	2.1167	5 4 1.1	11.909	2	1 34 24.87	2.0127	4 25 26.4	11.437
3	23 57 50.46	2.1135	4 52 6.1	11.924	3	1 36 25.60	2.0117	4 36 51.7	11.406
4	23 59 57.18	2.1104	4 40 10.2	11.938	4	1 38 26.27	2.0106	4 48 15.1	11.372
5	0 2 3.71	2.1072	4 28 13.5	11.951	5	1 40 26.87	2.0096	4 59 36.4	11.338
6	0 4 10.04	2.1040	4 16 16.1	11.962	6	1 42 27.42	2.0087	5 10 55.7	11.303
7	0 6 16.19	2.1011	4 4 18.1	11.972	7	1 44 27.91	2.0077	5 22 12.8	11.267
8	0 8 22.17	2.0982	3 52 19.5	11.981	8	1 46 28.35	2.0069	5 33 27.8	11.231
9	0 10 27.97	2.0951	3 40 20.4	11.988	9	1 48 28.74	2.0061	5 44 40.5	11.193
10	0 12 33.58	2.0921	3 28 20.9	11.995	10	1 50 29.08	2.0053	5 55 51.0	11.156
11	0 14 39.02	2.0892	3 16 21.0	12.002	11	1 52 29.38	2.0047	6 6 59.2	11.117
12	0 16 44.29	2.0865	3 4 20.7	12.007	12	1 54 29.64	2.0040	6 18 5.1	11.078
13	0 18 49.40	2.0837	2 52 20.2	12.009	13	1 56 29.86	2.0033	6 29 8.6	11.037
14	0 20 54.34	2.0809	2 40 19.6	12.011	14	1 58 30.04	2.0027	6 40 9.6	10.996
15	0 22 59.11	2.0782	2 28 18.9	12.012	15	2 0 30.18	2.0021	6 51 8.1	10.954
16	0 25 3.73	2.0757	2 16 18.1	12.013	16	2 2 30.29	2.0016	7 2 4.1	10.912
17	0 27 8.19	2.0730	2 4 17.3	12.012	17	2 4 30.37	2.0011	7 12 57.5	10.869
18	0 29 12.49	2.0704	1 52 16.6	12.011	18	2 6 30.42	2.0007	7 23 48.4	10.826
19	0 31 16.64	2.0679	1 40 16.0	12.007	19	2 8 30.45	2.0002	7 34 36.6	10.781
20	0 33 20.64	2.0655	1 28 15.7	12.003	20	2 10 30.45	1.9999	7 45 22.1	10.735
21	0 35 24.50	2.0632	1 16 15.6	11.999	21	2 12 30.44	1.9996	7 56 4.8	10.688
22	0 37 28.22	2.0607	1 4 15.8	11.993	22	2 14 30.40	1.9993	8 6 44.7	10.642
23	0 39 31.79	2.0583	0 52 16.4	11.986	23	2 16 30.35	1.9991	8 17 21.8	10.595
24	0 41 35.22	2.0561	S. 0 40 17.5	11.977	24	2 18 30.29	1.9988	N. 8 27 56.1	10.547

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 17.					TUESDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	2 18 30.29	1.9988	N. 8 27 56.1	10.547	0	3 54 50.13	2.0257	N. 15 47 8.5	7.539
1	2 20 30.21	1.9987	8 38 27.5	10.498	1	3 56 51.71	2.0268	15 54 38.6	7.461
2	2 22 30.13	1.9986	8 48 55.9	10.448	2	3 58 53.35	2.0280	16 2 4.2	7.388
3	2 24 30.04	1.9984	8 59 21.3	10.398	3	4 0 55.07	2.0292	16 9 25.2	7.312
4	2 26 29.94	1.9983	9 9 43.7	10.348	4	4 2 56.86	2.0304	16 16 41.6	7.235
5	2 28 29.84	1.9983	9 20 3.1	10.297	5	4 4 58.72	2.0316	16 23 53.4	7.158
6	2 30 29.74	1.9983	9 30 19.3	10.244	6	4 7 0.65	2.0328	16 31 0.6	7.081
7	2 32 29.64	1.9983	9 40 32.4	10.192	7	4 9 2.66	2.0341	16 38 3.1	7.002
8	2 34 29.54	1.9984	9 50 42.4	10.139	8	4 11 4.74	2.0353	16 45 0.8	6.922
9	2 36 29.45	1.9986	10 0 49.1	10.084	9	4 13 6.90	2.0366	16 51 53.8	6.844
10	2 38 29.37	1.9988	10 10 52.5	10.030	10	4 15 9.13	2.0378	16 58 42.1	6.765
11	2 40 29.30	1.9989	10 20 52.7	9.975	11	4 17 11.44	2.0391	17 5 25.6	6.685
12	2 42 29.24	1.9992	10 30 49.5	9.919	12	4 19 13.82	2.0403	17 12 4.3	6.605
13	2 44 29.20	1.9994	10 40 43.0	9.862	13	4 21 16.28	2.0417	17 18 38.2	6.524
14	2 46 29.17	1.9996	10 50 33.0	9.805	14	4 23 18.83	2.0431	17 25 7.2	6.442
15	2 48 29.15	1.9999	11 0 19.6	9.748	15	4 25 21.45	2.0443	17 31 31.3	6.362
16	2 50 29.16	2.0003	11 10 2.8	9.690	16	4 27 24.15	2.0457	17 37 50.6	6.280
17	2 52 29.19	2.0007	11 19 42.4	9.631	17	4 29 26.93	2.0470	17 44 4.9	6.197
18	2 54 29.24	2.0011	11 29 18.5	9.572	18	4 31 29.79	2.0484	17 50 14.3	6.114
19	2 56 29.32	2.0016	11 38 51.0	9.512	19	4 33 32.74	2.0498	17 56 18.6	6.031
20	2 58 29.43	2.0020	11 48 19.9	9.452	20	4 35 35.76	2.0510	18 2 18.0	5.948
21	3 0 29.56	2.0025	11 57 45.2	9.390	21	4 37 38.86	2.0524	18 8 12.4	5.864
22	3 2 29.73	2.0031	12 7 6.7	9.328	22	4 39 42.05	2.0538	18 14 1.7	5.779
23	3 4 29.93	2.0036	N. 12 16 24.6	9.267	23	4 41 45.32	2.0552	N. 18 19 45.9	5.695
MONDAY 18.					WEDNESDAY 20.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	3 6 30.16	2.0042	N. 12 25 38.7	9.203	0	4 43 48.67	2.0565	N. 18 25 25.1	5.610
1	3 8 30.43	2.0048	12 34 49.0	9.140	1	4 45 52.10	2.0579	18 30 59.1	5.524
2	3 10 30.74	2.0055	12 43 55.5	9.076	2	4 47 55.62	2.0593	18 36 28.0	5.439
3	3 12 31.09	2.0062	12 52 58.1	9.012	3	4 49 59.22	2.0607	18 41 51.8	5.353
4	3 14 31.48	2.0068	13 1 56.9	8.947	4	4 52 2.90	2.0621	18 47 10.4	5.266
5	3 16 31.91	2.0076	13 10 51.7	8.881	5	4 54 6.67	2.0635	18 52 23.7	5.179
6	3 18 32.39	2.0083	13 19 42.6	8.815	6	4 56 10.52	2.0648	18 57 31.9	5.092
7	3 20 32.91	2.0090	13 28 29.5	8.748	7	4 58 14.45	2.0662	19 2 34.8	5.004
8	3 22 33.47	2.0098	13 37 12.4	8.682	8	5 0 18.46	2.0675	19 7 32.4	4.916
9	3 24 34.09	2.0107	13 45 51.3	8.614	9	5 2 22.56	2.0690	19 12 24.7	4.827
10	3 26 34.76	2.0116	13 54 26.1	8.546	10	5 4 26.74	2.0703	19 17 11.7	4.739
11	3 28 35.48	2.0124	14 2 56.8	8.477	11	5 6 31.00	2.0717	19 21 53.4	4.651
12	3 30 36.25	2.0133	14 11 23.3	8.407	12	5 8 35.35	2.0732	19 26 29.8	4.562
13	3 32 37.08	2.0142	14 19 45.7	8.338	13	5 10 39.78	2.0745	19 31 0.8	4.472
14	3 34 37.96	2.0152	14 28 3.9	8.268	14	5 12 44.29	2.0758	19 35 26.4	4.382
15	3 36 38.90	2.0162	14 36 17.9	8.197	15	5 14 48.88	2.0772	19 39 46.6	4.292
16	3 38 39.90	2.0172	14 44 27.6	8.126	16	5 16 53.55	2.0786	19 44 1.4	4.201
17	3 40 40.96	2.0182	14 52 33.0	8.054	17	5 18 58.31	2.0799	19 48 10.7	4.109
18	3 42 42.08	2.0192	15 0 34.1	7.982	18	5 21 3.14	2.0812	19 52 14.5	4.018
19	3 44 43.26	2.0202	15 8 30.9	7.910	19	5 23 8.05	2.0826	19 56 12.9	3.927
20	3 46 44.50	2.0212	15 16 23.3	7.836	20	5 25 13.05	2.0839	20 0 5.8	3.835
21	3 48 45.81	2.0223	15 24 11.2	7.762	21	5 27 18.12	2.0852	20 3 53.1	3.742
22	3 50 47.18	2.0234	15 31 54.8	7.689	22	5 29 23.28	2.0866	20 7 34.9	3.651
23	3 52 48.62	2.0246	15 39 33.9	7.614	23	5 31 28.51	2.0878	20 11 11.2	3.558
24	3 54 50.13	2.0257	N. 15 47 8.5	7.539	24	5 33 33.82	2.0892	N. 20 14 41.9	3.465



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 21.					SATURDAY 23.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
1	5 33 33.82	2.0892	20 14 41.9	3.465	1	7 15 3.23	2.1323	21 9 35.5	1.242
2	5 35 39.21	2.0904	20 18 7.0	3.372	2	7 17 11.18	2.1327	21 8 18.0	1.342
3	5 37 44.67	2.0917	20 21 26.5	3.278	3	7 19 19.16	2.1332	21 6 54.5	1.442
4	5 39 50.21	2.0930	20 24 40.4	3.184	4	7 21 27.16	2.1335	21 5 24.9	1.544
5	5 41 55.83	2.0942	20 27 48.6	3.090	5	7 23 35.18	2.1337	21 3 49.2	1.645
6	5 44 1.52	2.0954	20 30 51.2	2.996	6	7 25 43.21	2.1340	21 2 7.5	1.745
7	5 46 7.28	2.0967	20 33 48.1	2.902	7	7 27 51.26	2.1343	21 0 19.8	1.846
8	5 48 13.12	2.0979	20 36 39.4	2.807	8	7 29 59.33	2.1347	20 58 26.0	1.947
9	5 50 19.03	2.0991	20 39 24.9	2.711	9	7 32 7.42	2.1348	20 56 26.2	2.048
10	5 52 25.01	2.1002	20 42 4.7	2.616	10	7 34 15.51	2.1350	20 54 20.3	2.149
11	5 54 31.06	2.1015	20 44 38.8	2.521	11	7 36 23.62	2.1352	20 52 8.3	2.250
12	5 56 37.19	2.1027	20 47 7.2	2.425	12	7 38 31.74	2.1354	20 49 50.3	2.350
13	5 58 43.38	2.1037	20 49 29.8	2.328	13	7 40 39.87	2.1356	20 47 26.3	2.451
14	6 0 49.64	2.1049	20 51 46.6	2.232	14	7 42 48.01	2.1357	20 44 56.2	2.552
15	6 2 55.97	2.1061	20 53 57.7	2.136	15	7 44 56.15	2.1357	20 42 20.1	2.652
16	6 5 2.37	2.1072	20 56 2.9	2.039	16	7 47 4.30	2.1358	20 39 38.0	2.752
17	6 7 8.83	2.1082	20 58 2.4	1.942	17	7 49 12.45	2.1358	20 36 49.8	2.853
18	6 9 15.35	2.1093	20 59 56.0	1.845	18	7 51 20.60	2.1358	20 33 55.6	2.953
19	6 11 21.94	2.1103	21 1 43.8	1.748	19	7 53 28.75	2.1359	20 30 55.4	3.053
20	6 13 28.59	2.1113	21 3 25.8	1.651	20	7 55 36.91	2.1359	20 27 49.2	3.154
21	6 15 35.30	2.1123	21 5 1.9	1.552	21	7 57 45.06	2.1358	20 24 36.9	3.254
22	6 17 42.07	2.1133	21 6 32.1	1.454	22	7 59 53.21	2.1357	20 21 18.7	3.353
23	6 19 48.90	2.1143	21 7 56.4	1.356	23	8 2 1.35	2.1357	20 17 54.5	3.453
24	6 21 55.79	2.1152	N. 21 9 14.8	1.258	24	8 4 9.49	2.1357	N. 20 14 24.3	3.553
FRIDAY 22.					SUNDAY 24.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
1	6 24 2.73	2.1162	N. 21 10 27.4	1.160	1	8 6 17.63	2.1356	N. 20 10 48.1	3.653
2	6 26 9.73	2.1172	21 11 34.0	1.061	2	8 8 25.76	2.1354	20 7 5.9	3.752
3	6 28 16.79	2.1181	21 12 34.7	0.962	3	8 10 33.88	2.1352	20 3 17.8	3.851
4	6 30 23.90	2.1189	21 13 29.5	0.863	4	8 12 41.99	2.1351	19 59 23.8	3.950
5	6 32 31.06	2.1198	21 14 18.3	0.763	5	8 14 50.09	2.1348	19 55 23.8	4.049
6	6 34 38.27	2.1207	21 15 1.1	0.664	6	8 16 58.17	2.1347	19 51 17.9	4.148
7	6 36 45.54	2.1215	21 15 38.0	0.565	7	8 19 6.25	2.1345	19 47 6.0	4.247
8	6 38 52.85	2.1222	21 16 8.9	0.466	8	8 21 14.31	2.1342	19 42 48.2	4.345
9	6 41 0.20	2.1229	21 16 33.9	0.367	9	8 23 22.35	2.1339	19 38 24.6	4.443
10	6 43 7.60	2.1237	21 16 52.9	0.266	10	8 25 30.38	2.1337	19 33 55.0	4.542
11	6 45 15.05	2.1245	21 17 5.8	0.166	11	8 27 38.39	2.1334	19 29 19.6	4.639
12	6 47 22.54	2.1252	21 17 12.8	+0.067	12	8 29 46.39	2.1331	19 24 38.3	4.737
13	6 49 30.07	2.1258	21 17 13.8	-0.033	13	8 31 54.36	2.1327	19 19 51.1	4.835
14	6 51 37.64	2.1265	21 17 8.8	0.134	14	8 34 2.32	2.1324	19 14 58.1	4.932
15	6 53 45.25	2.1272	21 16 57.7	0.234	15	8 36 10.25	2.1320	19 9 59.3	5.028
16	6 55 52.90	2.1278	21 16 40.7	0.334	16	8 38 18.16	2.1317	19 4 54.7	5.125
17	6 58 0.59	2.1284	21 16 17.6	0.436	17	8 40 26.05	2.1313	18 59 44.3	5.222
18	7 0 8.31	2.1289	21 15 48.4	0.536	18	8 42 33.92	2.1309	18 54 28.1	5.317
19	7 2 16.06	2.1295	21 15 13.3	0.636	19	8 44 41.76	2.1304	18 49 6.2	5.413
20	7 4 23.85	2.1301	21 14 32.1	0.737	20	8 46 49.57	2.1300	18 43 38.5	5.508
21	7 6 31.67	2.1306	21 13 44.9	0.837	21	8 48 57.36	2.1297	18 38 5.2	5.603
22	7 8 39.52	2.1310	21 12 51.6	0.938	22	8 51 5.13	2.1292	18 32 26.1	5.699
23	7 10 47.39	2.1315	21 11 52.3	1.038	23	8 53 12.87	2.1287	18 26 41.3	5.794
24	7 12 55.30	2.1320	21 10 47.0	1.140	24	8 55 20.58	2.1282	18 20 50.8	5.888
	7 15 3.23	2.1323	N. 21 9 35.5	1.242		8 57 28.26	2.1277	N. 18 14 54.7	5.982

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 25.					WEDNESDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 57 28.26	2.1277	N. 18 14 54.7	5.982	0	10 39 0.16	2.1044	N. 11 47 18.0	9.970
1	8 59 35.91	2.1273	18 8 53.0	6.076	1	10 41 6.42	2.1042	11 37 17.7	10.039
2	9 1 43.54	2.1268	18 2 45.6	6.169	2	10 43 12.66	2.1039	11 27 13.3	10.107
3	9 3 51.13	2.1262	17 56 32.7	6.262	3	10 45 18.89	2.1037	11 17 4.9	10.174
4	9 5 58.69	2.1257	17 50 14.1	6.356	4	10 47 25.10	2.1035	11 6 52.4	10.242
5	9 8 6.22	2.1252	17 43 50.0	6.448	5	10 49 31.31	2.1033	10 56 35.9	10.307
6	9 10 13.72	2.1247	17 37 20.4	6.539	6	10 51 37.50	2.1032	10 46 15.5	10.372
7	9 12 21.19	2.1242	17 30 45.3	6.631	7	10 53 43.69	2.1031	10 35 51.2	10.437
8	9 14 28.63	2.1237	17 24 4.7	6.722	8	10 55 49.87	2.1030	10 25 23.1	10.500
9	9 16 36.04	2.1232	17 17 18.6	6.813	9	10 57 56.05	2.1029	10 14 51.2	10.562
10	9 18 43.41	2.1226	17 10 27.1	6.904	10	11 0 2.22	2.1027	10 4 15.6	10.625
11	9 20 50.75	2.1221	17 3 30.1	6.994	11	11 2 8.38	2.1027	9 53 36.2	10.687
12	9 22 58.06	2.1215	16 56 27.8	7.083	12	11 4 14.55	2.1028	9 42 53.2	10.747
13	9 25 5.33	2.1209	16 49 20.1	7.172	13	11 6 20.72	2.1028	9 32 6.6	10.807
14	9 27 12.57	2.1204	16 42 7.1	7.262	14	11 8 26.89	2.1028	9 21 16.4	10.866
15	9 29 19.78	2.1198	16 34 48.7	7.350	15	11 10 33.06	2.1028	9 10 22.7	10.923
16	9 31 26.95	2.1192	16 27 25.1	7.437	16	11 12 39.23	2.1030	8 59 25.6	10.980
17	9 33 34.08	2.1187	16 19 56.2	7.525	17	11 14 45.42	2.1032	8 48 25.1	11.037
18	9 35 41.19	2.1182	16 12 22.1	7.612	18	11 16 51.61	2.1032	8 37 21.2	11.092
19	9 37 48.26	2.1176	16 4 42.7	7.699	19	11 18 57.81	2.1034	8 26 14.0	11.147
20	9 39 55.30	2.1170	15 56 58.2	7.785	20	11 21 4.02	2.1037	8 15 3.5	11.201
21	9 42 2.30	2.1165	15 49 8.5	7.871	21	11 23 10.25	2.1039	8 3 49.9	11.253
22	9 44 9.28	2.1160	15 41 13.7	7.956	22	11 25 16.49	2.1041	7 52 33.1	11.306
23	9 46 16.22	2.1154	N. 15 33 13.8	8.041	23	11 27 22.74	2.1044	N. 7 41 13.2	11.357
TUESDAY 26.					THURSDAY 28.				
0	9 48 23.13	2.1148	N. 15 25 8.8	8.125	0	11 29 29.02	2.1048	N. 7 29 50.3	11.407
1	9 50 30.00	2.1142	15 16 58.8	8.208	1	11 31 35.32	2.1052	7 18 24.4	11.457
2	9 52 36.84	2.1137	15 8 43.8	8.291	2	11 33 41.64	2.1055	7 6 55.5	11.505
3	9 54 43.65	2.1132	15 0 23.9	8.373	3	11 35 47.98	2.1059	6 55 23.8	11.552
4	9 56 50.43	2.1127	14 51 59.0	8.456	4	11 37 54.35	2.1063	6 43 49.3	11.598
5	9 58 57.18	2.1122	14 43 29.2	8.537	5	11 40 0.74	2.1068	6 32 12.0	11.644
6	10 1 3.89	2.1116	14 34 54.5	8.618	6	11 42 7.17	2.1074	6 20 32.0	11.689
7	10 3 10.57	2.1112	14 26 15.0	8.698	7	11 44 13.63	2.1079	6 8 49.3	11.733
8	10 5 17.23	2.1107	14 17 30.7	8.778	8	11 46 20.12	2.1085	5 57 4.0	11.775
9	10 7 23.85	2.1102	14 8 41.6	8.857	9	11 48 26.65	2.1092	5 45 16.3	11.817
10	10 9 30.45	2.1097	13 59 47.8	8.936	10	11 50 33.22	2.1098	5 33 26.0	11.858
11	10 11 37.01	2.1092	13 50 49.3	9.014	11	11 52 39.83	2.1105	5 21 33.3	11.898
12	10 13 43.55	2.1087	13 41 46.1	9.092	12	11 54 46.48	2.1112	5 9 38.2	11.937
13	10 15 50.06	2.1083	13 32 38.3	9.168	13	11 56 53.18	2.1120	4 57 40.9	11.974
14	10 17 56.55	2.1079	13 23 25.9	9.245	14	11 58 59.92	2.1128	4 45 41.3	12.012
15	10 20 3.01	2.1075	13 14 8.9	9.321	15	12 1 6.71	2.1136	4 33 39.5	12.048
16	10 22 9.45	2.1071	13 4 47.4	9.395	16	12 3 13.55	2.1145	4 21 35.6	12.082
17	10 24 15.86	2.1067	12 55 21.5	9.468	17	12 5 20.45	2.1154	4 9 29.7	12.115
18	10 26 22.25	2.1063	12 45 51.2	9.542	18	12 7 27.40	2.1163	3 57 21.8	12.148
19	10 28 28.62	2.1060	12 36 16.4	9.616	19	12 9 34.41	2.1174	3 45 11.9	12.180
20	10 30 34.97	2.1056	12 26 37.3	9.688	20	12 11 41.49	2.1184	3 33 0.2	12.210
21	10 32 41.29	2.1052	12 16 53.8	9.760	21	12 13 48.62	2.1194	3 20 46.7	12.240
22	10 34 47.60	2.1050	12 7 6.1	9.831	22	12 15 55.82	2.1206	3 8 31.4	12.268
23	10 36 53.89	2.1047	11 57 14.1	9.901	23	12 18 3.09	2.1217	2 56 14.5	12.295
24	10 39 0.16	2.1044	N. 11 47 18.0	9.970	24	12 20 10.42	2.1228	N. 2 43 56.0	12.321

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 29.					SUNDAY 31.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	12 20 10.42	2.1228	N. 2 43 56.0	12.321	0	14 4 12.02	2.2271	S. 7 15 20.9	12.167
1	12 22 17.83	2.1241	2 31 35.9	12.347	1	14 6 25.74	2.2304	7 27 29.9	12.132
2	12 24 25.31	2.1253	2 19 14.4	12.370	2	14 8 39.64	2.2333	7 39 36.8	12.096
3	12 26 32.87	2.1266	2 6 51.5	12.393	3	14 10 53.73	2.2365	7 51 41.4	12.058
4	12 28 40.50	2.1279	1 54 27.2	12.415	4	14 13 8.02	2.2397	8 3 43.7	12.019
5	12 30 48.22	2.1294	1 42 1.7	12.436	5	14 15 22.50	2.2429	8 15 43.7	11.979
6	12 32 56.03	2.1308	1 29 34.9	12.456	6	14 17 37.17	2.2462	8 27 41.2	11.937
7	12 35 3.92	2.1322	1 17 7.0	12.473	7	14 19 52.05	2.2495	8 39 36.1	11.893
8	12 37 11.89	2.1337	1 4 38.1	12.491	8	14 22 7.12	2.2528	8 51 28.4	11.849
9	12 39 19.96	2.1352	0 52 8.1	12.507	9	14 24 22.39	2.2562	9 3 18.0	11.803
10	12 41 28.12	2.1368	0 39 37.2	12.522	10	14 26 37.87	2.2597	9 15 4.8	11.756
11	12 43 36.38	2.1385	0 27 5.5	12.536	11	14 28 53.55	2.2630	9 26 48.7	11.707
12	12 45 44.74	2.1402	0 14 32.9	12.549	12	14 31 9.43	2.2664	9 38 29.7	11.657
13	12 47 53.20	2.1418	N. 0 1 59.6	12.560	13	14 33 25.52	2.2700	9 50 7.6	11.606
14	12 50 1.76	2.1435	S. 0 10 34.3	12.570	14	14 35 41.83	2.2735	10 1 42.4	11.553
15	12 52 10.42	2.1453	0 23 8.8	12.579	15	14 37 58.34	2.2770	10 13 14.0	11.499
16	12 54 19.20	2.1472	0 35 43.8	12.587	16	14 40 15.07	2.2806	10 24 42.3	11.443
17	12 56 28.09	2.1491	0 48 19.2	12.593	17	14 42 32.01	2.2842	10 36 7.2	11.387
18	12 58 37.09	2.1509	1 0 55.0	12.599	18	14 44 49.17	2.2877	10 47 28.7	11.328
19	13 0 46.20	2.1529	1 13 31.1	12.603	19	14 47 6.54	2.2913	10 58 46.6	11.268
20	13 2 55.44	2.1550	1 26 7.4	12.606	20	14 49 24.13	2.2950	11 10 0.9	11.207
21	13 5 4.80	2.1570	1 38 43.8	12.607	21	14 51 41.94	2.2987	11 21 11.5	11.145
22	13 7 14.28	2.1590	1 51 20.3	12.608	22	14 53 59.97	2.3023	11 32 18.3	11.082
23	13 9 23.88	2.1612	S. 2 3 56.8	12.607	23	14 56 18.22	2.3060	S. 11 43 21.3	11.017
SATURDAY 30.					MONDAY, APRIL 1.				
0	13 11 33.62	2.1633	S. 2 16 33.2	12.606	0	14 58 36.69	2.3097	S. 11 54 20.3	10.950
1	13 13 43.48	2.1655	2 29 9.5	12.602	PHASES OF THE MOON.				
2	13 15 53.48	2.1677	2 41 45.5	12.597					
3	13 18 3.61	2.1700	2 54 21.2	12.592					
4	13 20 13.88	2.1723	3 6 56.5	12.584					
5	13 22 24.29	2.1747	3 19 31.3	12.576					
6	13 24 34.85	2.1772	3 32 5.6	12.567					
7	13 26 45.55	2.1796	3 44 39.3	12.556					
8	13 28 56.40	2.1821	3 57 12.3	12.543					
9	13 31 7.40	2.1846	4 9 44.5	12.530					
10	13 33 18.55	2.1872	4 22 15.9	12.515					
11	13 35 29.86	2.1898	4 34 46.3	12.498					
12	13 37 41.33	2.1925	4 47 15.7	12.481					
13	13 39 52.96	2.1952	4 59 44.0	12.462					
14	13 42 4.75	2.1978	5 12 11.2	12.442					
15	13 44 16.70	2.2006	5 24 37.1	12.421					
16	13 46 28.82	2.2033	5 37 1.7	12.397					
17	13 48 41.10	2.2062	5 49 24.8	12.373					
18	13 50 53.56	2.2092	6 1 46.5	12.348					
19	13 53 6.20	2.2121	6 14 6.6	12.322					
20	13 55 19.01	2.2149	6 26 25.1	12.294					
21	13 57 31.99	2.2178	6 38 41.9	12.264					
22	13 59 45.15	2.2208	6 50 56.8	12.232					
23	14 1 58.49	2.2239	7 3 9.8	12.201					
24	14 4 12.02	2.2271	S. 7 15 20.9	12.167					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Aldebaran W.	106 31 9	2572	108 10 43	2563	109 50 29	2554	111 30 28	2545
	JUPITER W.	83 42 34	2580	85 21 57	2570	87 1 33	2561	88 41 21	2553
	Pollux W.	62 31 9	2618	64 9 40	2608	65 48 24	2598	67 27 22	2588
	Regulus W.	26 24 18	2582	28 3 38	2571	29 43 13	2561	31 23 1	2552
	Antares E.	74 10 55	2626	72 32 34	2618	70 54 3	2610	69 15 21	2602
	MARS E.	78 59 50	2763	77 24 34	2753	75 49 5	2744	74 13 24	2735
	α Aquilæ E.	118 13 20	3344	116 49 59	3312	115 26 1	3282	114 1 29	3256
2	JUPITER W.	97 3 13	2512	98 44 9	2505	100 25 15	2498	102 6 31	2490
	Pollux W.	75 45 29	2543	77 25 43	2535	79 6 8	2527	80 46 45	2519
	Regulus W.	39 45 11	2508	41 26 13	2500	43 7 26	2492	44 48 50	2485
	Antares E.	60 59 28	2570	59 19 52	2564	57 40 8	2559	56 0 17	2555
	MARS E.	66 12 2	2693	64 35 12	2685	62 58 12	2677	61 21 2	2669
	α Aquilæ E.	106 51 28	3144	105 24 11	3126	103 56 33	3109	102 28 34	3093
3	JUPITER W.	110 35 21	2457	112 17 35	2451	113 59 57	2445	115 42 28	2438
	Pollux W.	89 12 24	2483	90 54 1	2477	92 35 47	2471	94 17 42	2465
	Regulus W.	53 18 28	2449	55 0 53	2443	56 43 27	2436	58 26 11	2430
	Antares E.	47 39 45	2541	45 59 29	2540	44 19 11	2540	42 38 53	2541
	MARS E.	53 12 42	2635	51 34 35	2629	49 56 19	2623	48 17 55	2617
	α Aquilæ E.	95 4 23	3034	93 34 52	3026	92 5 11	3018	90 35 20	3010
4	Pollux W.	102 49 17	2438	104 31 58	2433	106 14 46	2428	107 57 41	2424
	Regulus W.	67 1 59	2401	68 45 33	2395	70 29 15	2389	72 13 5	2385
	Antares E.	34 18 20	2567	32 38 39	2570	30 59 15	2593	29 20 10	2611
	MARS E.	40 3 58	2591	38 24 50	2586	36 45 36	2582	35 6 16	2579
	α Aquilæ E.	83 4 28	2994	81 34 8	2994	80 3 48	2996	78 33 30	2998
	SUN E.	127 4 30	2735	125 28 37	2729	123 52 35	2723	122 16 26	2717
5	Regulus W.	80 54 1	2360	82 38 33	2355	84 23 12	2351	86 7 57	2347
	Spica W.	27 45 46	2510	29 26 46	2489	31 8 14	2472	32 50 6	2457
	MARS E.	26 48 34	2566	25 8 53	2566	23 29 12	2568	21 49 33	2571
	α Aquilæ E.	71 3 17	3030	69 33 42	3041	68 4 20	3054	66 35 14	3070
	SUN E.	114 13 46	2690	112 36 53	2686	110 59 54	2681	109 22 48	2676
6	Regulus W.	94 53 12	2327	96 38 32	2324	98 23 57	2320	100 9 28	2316
	Spica W.	41 24 11	2401	43 7 45	2392	44 51 31	2384	46 35 29	2377
	α Aquilæ E.	59 15 10	3178	57 48 34	3207	56 22 33	3240	54 57 11	3278
	SUN E.	101 15 44	2654	99 38 2	2650	98 0 14	2646	96 22 21	2642
7	Regulus W.	108 58 16	2300	110 44 15	2297	112 30 19	2294	114 16 27	2292
	Spica W.	55 17 43	2347	57 2 34	2342	58 47 32	2337	60 32 37	2333
	SUN E.	88 11 43	2685	86 33 22	2621	84 54 56	2618	83 16 26	2616
8	Spica W.	69 19 28	2316	71 5 4	2313	72 50 44	2311	74 36 27	2309
	Antares W.	24 19 27	2570	25 59 3	2534	27 39 29	2503	29 20 38	2477
	MARS W.	14 20 26	2546	16 0 35	2526	17 41 12	2510	19 22 11	2497
	SUN E.	75 3 7	2604	73 24 18	2603	71 45 27	2601	70 6 34	2600
9	Spica W.	83 25 44	2302	85 11 41	2302	86 57 38	2301	88 43 36	2302
	Antares W.	37 53 43	2398	39 37 20	2388	41 21 12	2380	43 5 15	2373
	MARS W.	27 50 26	2465	29 32 29	2462	31 14 36	2459	32 56 47	2457

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Aldebaran W.	113 10 38	2537	114 51 0	2528	116 31 34	2520	118 12 19	2512
	JUPITER W.	90 21 20	2545	92 1 31	2536	93 41 54	2528	95 22 28	2520
	Pollux W.	69 6 34	2578	70 45 59	2569	72 25 36	2560	74 5 26	2551
	Regulus W.	33 3 2	2543	34 43 16	2534	36 23 42	2525	38 4 21	2517
	Antares E.	67 36 29	2595	65 57 27	2588	64 18 16	2582	62 38 56	2576
	MARS E.	72 37 30	2726	71 1 25	2718	69 25 9	2709	67 48 41	2701
	α Aquilæ E.	112 36 26	3231	111 10 53	3207	109 44 51	3184	108 18 22	3163
2	JUPITER W.	103 47 58	2484	105 29 34	2477	107 11 20	2470	108 53 16	2463
	Pollux W.	82 27 32	2511	84 8 30	2504	85 49 38	2497	87 30 56	2490
	Regulus W.	46 30 25	2477	48 12 10	2470	49 54 6	2462	51 36 12	2455
	Antares E.	54 20 20	2551	52 40 17	2548	51 0 10	2545	49 19 59	2543
	MARS E.	59 43 41	2662	58 6 10	2655	56 28 30	2648	54 50 40	2642
	α Aquilæ E.	101 0 15	3079	99 31 39	3066	98 2 49	3054	96 33 43	3043
3	JUPITER W.	117 25 8	2433	119 7 55	2427	120 50 51	2422	122 33 54	2417
	Pollux W.	95 59 45	2459	97 41 57	2453	99 24 16	2448	101 6 43	2443
	Regulus W.	60 9 3	2424	61 52 4	2417	63 35 14	2411	65 18 32	2405
	Antares E.	40 58 37	2543	39 18 24	2546	37 38 15	2551	35 58 13	2558
	MARS E.	46 39 22	2611	45 0 42	2605	43 21 54	2600	41 42 59	2596
	α Aquilæ E.	89 5 20	3005	87 35 13	3001	86 5 2	2998	84 34 47	2995
4	Pollux W.	109 40 42	2420	111 23 48	2416	113 7 0	2412	114 50 18	2409
	Regulus W.	73 57 2	2380	75 41 6	2375	77 25 17	2370	79 9 36	2365
	Antares E.	27 41 30	2634	26 3 21	2663	24 25 51	2700	22 49 11	2747
	MARS E.	33 26 52	2575	31 47 23	2572	30 7 50	2570	28 28 13	2568
	α Aquilæ E.	77 3 15	3002	75 33 4	3007	74 3 0	3014	72 33 4	3021
	SUN E.	120 40 9	2711	119 3 44	2706	117 27 12	2700	115 50 32	2695
5	Regulus W.	87 52 48	2343	89 37 45	2339	91 22 48	2335	93 7 57	2331
	Spica W.	34 32 19	2443	36 14 52	2431	37 57 43	2420	39 40 50	2410
	MARS E.	20 9 57	2576	18 30 28	2584	16 51 11	2596	15 12 10	2611
	α Aquilæ E.	65 6 28	3087	63 38 2	3105	62 9 57	3126	60 42 18	3151
	SUN E.	107 45 35	2672	106 8 17	2667	104 30 52	2662	102 53 21	2658
6	Regulus W.	101 55 4	2313	103 40 45	2310	105 26 30	2306	107 12 21	2303
	Spica W.	48 19 38	2370	50 3 56	2364	51 48 23	2358	53 32 59	2352
	α Aquilæ E.	53 32 34	3320	52 8 46	3366	50 45 51	3418	49 23 55	3477
	SUN E.	94 44 23	2638	93 6 20	2635	91 28 13	2631	89 50 0	2628
7	Regulus W.	116 2 38	2289	117 48 53	2287	119 35 11	2285	121 21 33	2283
	Spica W.	62 17 49	2329	64 3 6	2326	65 48 28	2322	67 33 56	2319
	SUN E.	81 37 53	2613	79 59 16	2611	78 20 36	2609	76 41 53	2607
8	Spica W.	76 22 14	2307	78 8 3	2305	79 53 55	2304	81 39 49	2303
	Antares W.	31 2 23	2455	32 44 39	2438	34 27 20	2433	36 10 22	2410
	MARS W.	21 3 28	2488	22 44 58	2480	24 26 39	2474	26 8 29	2469
	SUN E.	68 27 39	2599	66 48 42	2598	65 9 45	2597	63 30 46	2597
9	Spica W.	90 29 33	2302	92 15 30	2303	94 1 25	2304	95 47 19	2305
	Antares W.	44 49 29	2367	46 33 51	2362	48 18 21	2357	50 2 57	2354
	MARS W.	34 39 1	2455	36 21 17	2455	38 3 34	2454	39 45 52	2453

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
9	SUN E.	61 51 47	2596	60 12 47	2597	58 33 48	2598	56 54 49	2599
10	Spica W.	97 33 11	2307	99 19 0	2309	101 4 46	2311	102 50 29	2314
	Antares W.	51 47 38	2352	53 32 22	2350	55 17 8	2349	57 1 56	2348
	MARS W.	41 28 11	2454	43 10 29	2455	44 52 45	2456	46 35 0	2458
	SUN E.	48 40 21	2607	47 1 36	2610	45 22 55	2614	43 44 19	2618
11	Spica W.	111 37 50	2335	113 22 59	2340	115 8 0	2346	116 52 53	2353
	Antares W.	65 45 52	2355	67 30 32	2357	69 15 9	2360	70 59 41	2364
	MARS W.	55 5 27	2472	56 47 19	2476	58 29 6	2480	60 10 47	2485
	SUN E.	35 32 49	2645	33 54 55	2653	32 17 12	2661	30 39 40	2670
16	SUN W.	28 4 4	3096	29 32 18	3107	31 0 19	3119	32 28 6	3131
	JUPITER E.	69 14 41	2726	67 38 36	2740	66 2 49	2754	64 27 20	2768
	Pollux E.	90 7 8	2737	88 31 17	2751	86 55 45	2765	85 20 31	2779
17	SUN W.	39 43 19	3193	41 9 37	3206	42 35 39	3218	44 1 27	3231
	JUPITER E.	56 34 30	2836	55 0 49	2850	53 27 26	2863	51 54 20	2876
	Pollux E.	77 28 53	2847	75 55 26	2861	74 22 17	2874	72 49 25	2887
	Regulus E.	113 17 5	2811	111 42 52	2824	110 8 55	2837	108 35 15	2849
18	SUN W.	51 6 46	3292	52 31 7	3303	53 55 15	3314	55 19 10	3325
	JUPITER E.	44 12 54	2939	42 41 24	2950	41 10 9	2962	39 39 9	2973
	Pollux E.	65 9 14	2951	63 38 0	2964	62 7 2	2976	60 36 19	2988
	Regulus E.	100 50 52	2909	99 18 45	2920	97 46 51	2931	96 15 11	2941
19	SUN W.	62 15 44	3375	63 38 29	3384	65 1 3	3392	66 23 28	3400
	JUPITER E.	32 7 35	3026	30 37 55	3037	29 8 28	3047	27 39 13	3057
	Pollux E.	53 6 23	3045	51 37 6	3056	50 8 2	3067	48 39 11	3077
	Regulus E.	88 40 2	2989	87 9 35	2997	85 39 19	3005	84 9 13	3013
20	SUN W.	73 13 28	3434	74 35 6	3439	75 56 38	3444	77 18 5	3448
	$\alpha$ Arietis W.	38 1 9	3453	39 22 26	3433	40 44 5	3415	42 6 5	3399
	Pollux E.	41 18 12	3129	39 50 37	3140	38 23 16	3151	36 56 8	3162
	Regulus E.	76 40 53	3044	75 11 35	3049	73 42 24	3054	72 13 18	3058
21	SUN W.	84 4 17	3463	85 25 23	3464	86 46 27	3464	88 7 31	3464
	$\alpha$ Arietis W.	49 0 11	3337	50 23 40	3326	51 47 21	3316	53 11 14	3307
	Aldebaran W.	15 27 5	3085	16 55 33	3084	18 24 1	3083	19 52 31	3082
	Regulus E.	64 48 54	3072	63 20 10	3073	61 51 28	3073	60 22 46	3073
	Spica E.	118 33 58	3112	117 6 3	3111	115 38 7	3111	114 10 11	3111
22	SUN W.	94 52 59	3457	96 14 10	3454	97 35 25	3451	98 56 44	3447
	$\alpha$ Arietis W.	60 13 10	3265	61 38 3	3256	63 3 5	3247	64 28 18	3239
	Aldebaran W.	27 15 34	3070	28 44 20	3067	30 13 10	3063	31 42 5	3059
	Regulus E.	52 59 9	3068	51 30 20	3065	50 1 28	3062	48 32 32	3059
	Spica E.	106 50 8	3100	105 21 59	3097	103 53 46	3093	102 25 28	3089
23	SUN W.	105 44 35	3420	107 6 29	3414	108 28 30	3406	109 50 40	3398
	$\alpha$ Arietis W.	71 36 53	3196	73 3 7	3187	74 29 32	3177	75 56 9	3168
	Aldebaran W.	39 8 6	3031	40 37 40	3025	42 7 22	3018	43 37 13	3010
	JUPITER W.	15 27 44	3111	16 55 40	3097	18 23 53	3084	19 52 22	3072

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
9	SUN	E.	55 15 52	2599	53 36 56	2600	51 58 1	2602	50 19 9	2605
10	Spica	W.	104 36 8	2317	106 21 42	2321	108 7 11	2325	109 52 34	2330
	Antares	W.	58 46 45	2348	60 31 34	2349	62 16 22	2350	64 1 8	2352
	MARS	W.	48 17 12	2460	49 59 21	2462	51 41 27	2465	53 23 29	2468
	SUN	E.	42 5 48	2622	40 27 23	2627	38 49 4	2632	37 10 52	2638
11	Spica	W.	118 37 36	2359	120 22 10	2366	122 6 33	2374	123 50 46	2382
	Antares	W.	72 44 7	2368	74 28 27	2373	76 12 40	2379	77 56 45	2384
	MARS	W.	61 52 21	2491	63 33 47	2496	65 15 6	2502	66 56 17	2507
	SUN	E.	29 2 20	2681	27 25 15	2692	25 48 25	2705	24 11 52	2719
16	SUN	W.	33 55 38	3143	35 22 55	3155	36 49 58	3168	38 16 46	3180
	JUPITER	E.	62 52 10	2782	61 17 19	2795	59 42 45	2809	58 8 29	2822
	Pollux	E.	83 45 36	2793	82 10 59	2806	80 36 39	2820	79 2 37	2834
17	SUN	W.	45 27 0	3243	46 52 18	3256	48 17 21	3268	49 42 10	3280
	JUPITER	E.	50 21 30	2889	48 48 57	2901	47 16 40	2914	45 44 39	2927
	Pollux	E.	71 16 49	2901	69 44 31	2913	68 12 29	2926	66 40 44	2939
	Regulus	E.	107 1 51	2862	105 28 43	2874	103 55 51	2886	102 23 14	2898
18	SUN	W.	56 42 53	3336	58 6 23	3346	59 29 41	3356	60 52 48	3365
	JUPITER	E.	38 8 23	2985	36 37 51	2996	35 7 33	3006	33 37 28	3016
	Pollux	E.	59 5 51	3000	57 35 38	3011	56 5 39	3022	54 35 54	3034
	Regulus	E.	94 43 44	2951	93 12 30	2961	91 41 29	2971	90 10 40	2980
19	SUN	W.	67 45 45	3408	69 7 52	3415	70 29 51	3422	71 51 43	3428
	JUPITER	E.	26 10 10	3067	24 41 20	3076	23 12 41	3086	21 44 14	3095
	Pollux	E.	47 10 34	3088	45 42 9	3099	44 13 58	3109	42 45 59	3119
	Regulus	E.	82 39 16	3020	81 9 28	3027	79 39 49	3033	78 10 17	3039
20	SUN	W.	78 39 27	3452	80 0 44	3455	81 21 58	3458	82 43 9	3461
	α Arietis	W.	43 28 23	3384	44 50 58	3370	46 13 49	3358	47 36 54	3347
	Pollux	E.	35 29 13	3173	34 2 32	3186	32 36 6	3198	31 9 55	3213
	Regulus	E.	70 44 17	3062	69 15 21	3065	67 46 29	3068	66 17 40	3070
21	SUN	W.	89 28 35	3464	90 49 39	3463	92 10 44	3462	93 31 50	3460
	α Arietis	W.	54 35 17	3299	55 59 30	3290	57 23 53	3281	58 48 27	3273
	Aldebaran	W.	21 21 2	3080	22 49 36	3078	24 18 12	3076	25 46 51	3073
	Regulus	E.	58 54 4	3073	57 25 22	3073	55 56 40	3072	54 27 56	3070
	Spica	E.	112 42 15	3110	111 14 17	3108	109 46 17	3105	108 18 14	3103
22	SUN	W.	100 18 7	3443	101 39 35	3438	103 1 9	3432	104 22 49	3426
	α Arietis	W.	65 53 41	3231	67 19 13	3222	68 44 56	3213	70 10 49	3204
	Aldebaran	W.	33 11 5	3055	34 40 10	3049	36 9 22	3044	37 38 40	3038
	Regulus	E.	47 3 32	3055	45 34 27	3051	44 5 17	3045	42 36 0	3040
	Spica	E.	100 57 5	3084	99 28 37	3079	98 0 2	3074	96 31 21	3068
23	SUN	W.	111 12 59	3390	112 35 27	3381	113 58 5	3372	115 20 54	3362
	α Arietis	W.	77 22 57	3158	78 49 57	3148	80 17 8	3138	81 44 32	3128
	Aldebaran	W.	45 7 13	3002	46 37 23	2994	48 7 43	2985	49 38 15	2976
	JUPITER	W.	21 21 6	3059	22 50 6	3047	24 19 20	3036	25 48 48	3025

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
23	Regulus E.	41 6 37	3034	39 37 7	3028	38 7 29	3021	36 37 43	3014
	Spica E.	95 2 32	3062	93 33 36	3055	92 4 32	3048	90 35 19	3040
24	SUN W.	116 43 53	3352	118 7 4	3342	119 30 26	3332	120 54 0	3321
	α Arietis W.	83 12 8	3117	84 39 57	3107	86 7 58	3096	87 36 13	3085
	Aldebaran W.	51 8 58	2966	52 39 53	2956	54 11 1	2946	55 42 22	2936
	JUPITER W.	27 18 31	3014	28 48 27	3002	30 18 37	2990	31 49 3	2978
	Regulus E.	29 6 33	2975	27 35 49	2967	26 4 55	2958	24 33 49	2950
	Spica E.	83 6 46	2998	81 36 31	2988	80 6 4	2978	78 35 24	2968
25	α Arietis W.	95 0 49	3029	96 30 26	3018	98 0 17	3006	99 30 22	2995
	Aldebaran W.	63 22 32	2878	64 55 19	2866	66 28 21	2853	68 1 40	2840
	JUPITER W.	39 24 58	2916	40 56 56	2904	42 29 10	2891	44 1 41	2877
	Spica E.	70 58 49	2914	69 26 48	2902	67 54 32	2891	66 22 2	2879
	Antares E.	116 50 11	2937	115 18 39	2923	113 46 49	2909	112 14 42	2895
26	α Arietis W.	107 4 19	2939	108 35 48	2928	110 7 31	2918	111 39 27	2909
	Aldebaran W.	75 52 29	2774	77 27 31	2760	79 2 52	2746	80 38 31	2732
	JUPITER W.	51 48 35	2809	53 22 51	2795	54 57 25	2781	56 32 18	2766
	Pollux W.	32 22 53	2897	33 55 16	2873	35 28 10	2850	37 1 33	2829
	Spica E.	58 35 38	2819	57 1 34	2807	55 27 15	2795	53 52 40	2782
	Antares E.	104 29 34	2824	102 55 37	2809	101 21 21	2795	99 46 46	2780
27	Aldebaran W.	88 41 27	2661	90 18 59	2647	91 56 50	2633	93 35 0	2618
	JUPITER W.	64 31 26	2695	66 8 13	2681	67 45 18	2666	69 22 43	2652
	Pollux W.	44 55 8	2731	46 31 7	2713	48 7 29	2695	49 44 15	2676
	Spica E.	45 55 53	2726	44 19 48	2716	42 43 29	2707	41 6 58	2698
	Antares E.	91 49 6	2708	90 12 37	2694	88 35 49	2680	86 58 42	2666
	MARS E.	110 30 56	2835	108 57 13	2819	107 23 10	2804	105 48 48	2789
28	Aldebaran W.	101 50 38	2550	103 30 42	2537	105 11 4	2523	106 51 45	2510
	JUPITER W.	77 34 32	2583	79 13 50	2569	80 53 27	2556	82 33 22	2543
	Pollux W.	57 53 41	2598	59 32 39	2583	61 11 57	2568	62 51 36	2554
	Regulus W.	21 44 32	2565	23 24 15	2550	25 4 19	2535	26 44 44	2520
	Antares E.	78 48 29	2599	77 9 32	2586	75 30 18	2574	73 50 47	2561
	MARS E.	97 52 7	2717	96 15 49	2703	94 39 13	2689	93 2 18	2675
29	JUPITER W.	90 57 22	2482	92 39 1	2470	94 20 57	2459	96 3 9	2448
	Pollux W.	71 14 40	2487	72 56 12	2475	74 38 1	2462	76 20 7	2450
	Regulus W.	35 11 40	2454	36 53 58	2442	38 36 33	2430	40 19 25	2419
	Antares E.	65 29 8	2506	63 48 3	2496	62 6 44	2487	60 25 12	2478
	MARS E.	84 53 14	2610	83 14 33	2598	81 35 36	2586	79 56 22	2575
30	JUPITER W.	104 37 51	2398	106 21 29	2389	108 5 20	2380	109 49 23	2372
	Pollux W.	84 54 34	2398	86 38 11	2389	88 22 1	2381	90 6 3	2372
	Regulus W.	48 57 39	2366	50 42 2	2357	52 26 37	2348	54 11 26	2340
	Antares E.	51 54 39	2442	50 12 4	2437	48 29 23	2433	46 46 36	2430
	MARS E.	71 36 25	2522	69 55 43	2513	68 14 48	2504	66 33 41	2495
31	Pollux W.	98 49 4	2337	100 34 9	2331	102 19 23	2326	104 4 44	2322
	Regulus W.	62 58 23	2304	64 44 17	2298	66 30 20	2292	68 16 31	2286
	MARS E.	58 5 12	2459	56 23 0	2453	54 40 40	2447	52 58 11	2441



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
23	Regulus E.	35 7 48	3007	33 37 44	2999	32 7 30	2991	30 37 7	2983
	Spica E.	89 5 56	3033	87 36 24	3025	86 6 42	3016	84 36 49	3007
24	SUN W.	122 17 47	3310	123 41 47	3299	125 5 59	3287	126 30 25	3274
	α Arietis W.	89 4 41	3074	90 33 22	3063	92 2 17	3052	93 31 26	3040
	Aldebaran W.	57 13 55	2925	58 45 42	2913	60 17 44	2902	61 50 0	2890
	JUPITER W.	33 19 43	2966	34 50 38	2954	36 21 49	2941	37 53 16	2929
	Regulus E.	23 2 33	2941	21 31 6	2932	19 59 27	2923	18 27 37	2913
	Spica E.	77 4 32	2958	75 33 27	2947	74 2 8	2936	72 30 36	2925
25	α Arietis W.	101 0 41	2984	102 31 14	2973	104 2 2	2962	105 33 3	2950
	Aldebaran W.	69 35 16	2827	71 9 9	2815	72 43 18	2801	74 17 45	2788
	JUPITER W.	45 34 29	2864	47 7 34	2850	48 40 57	2837	50 14 37	2823
	Spica E.	64 49 16	2867	63 16 15	2855	61 42 58	2843	60 9 26	2831
	Antares E.	110 42 17	2881	109 9 34	2866	107 36 32	2852	106 3 12	2838
26	α Arietis W.	113 11 35	2899	114 43 55	2889	116 16 28	2880	117 49 13	2870
	Aldebaran W.	82 14 29	2718	83 50 45	2704	85 27 20	2689	87 4 14	2675
	JUPITER W.	58 7 30	2753	59 43 0	2738	61 18 50	2724	62 54 59	2710
	Pollux W.	38 35 23	2808	40 9 40	2788	41 44 24	2769	43 19 34	2750
	Spica E.	52 17 49	2771	50 42 42	2760	49 7 21	2748	47 31 44	2737
	Antares E.	98 11 52	2766	96 36 39	2751	95 1 7	2737	93 25 16	2722
27	Aldebaran W.	95 13 30	2604	96 52 19	2591	98 31 26	2577	100 10 53	2564
	JUPITER W.	71 0 27	2638	72 38 30	2624	74 16 52	2610	75 55 33	2597
	Pollux W.	51 21 24	2662	52 58 55	2645	54 36 49	2629	56 15 4	2613
	Spica E.	39 30 15	2689	37 53 21	2682	36 16 16	2676	34 39 2	2670
	Antares E.	85 21 16	2652	83 43 32	2638	82 5 29	2625	80 27 8	2612
	MARS E.	104 14 6	2775	102 39 5	2760	101 3 45	2746	99 28 6	2731
28	Aldebaran W.	108 32 44	2497	110 14 1	2485	111 55 35	2472	113 37 27	2460
	JUPITER W.	84 13 35	2530	85 54 6	2518	87 34 54	2506	89 16 0	2494
	Pollux W.	64 31 34	2540	66 11 52	2526	67 52 29	2512	69 33 25	2499
	Regulus W.	28 25 29	2506	30 6 34	2493	31 47 57	2480	33 29 39	2467
	Antares E.	72 10 59	2549	70 30 54	2538	68 50 34	2527	67 9 58	2517
	MARS E.	91 25 5	2662	89 47 34	2649	88 9 45	2636	86 31 38	2623
29	JUPITER W.	97 45 36	2437	99 28 18	2427	101 11 15	2417	102 54 26	2407
	Pollux W.	78 2 30	2439	79 45 9	2429	81 28 2	2418	83 11 11	2408
	Regulus W.	42 2 33	2408	43 45 57	2397	45 29 36	2387	47 13 30	2376
	Antares E.	58 43 27	2469	57 1 30	2462	55 19 23	2455	53 37 6	2448
	MARS E.	78 16 53	2564	76 37 8	2553	74 57 8	2543	73 16 54	2532
30	JUPITER W.	111 33 38	2364	113 18 5	2357	115 2 42	2350	116 47 29	2343
	Pollux W.	91 50 18	2364	93 34 44	2357	95 19 21	2350	97 4 8	2344
	Regulus W.	55 56 27	2332	57 41 40	2324	59 27 4	2317	61 12 38	2310
	Antares E.	45 3 44	2428	43 20 49	2427	41 37 53	2427	39 54 57	2429
	MARS E.	64 52 21	2487	63 10 50	2480	61 29 8	2472	59 47 15	2465
31	Pollux W.	105 50 12	2317	107 35 46	2313	109 21 26	2310	111 7 11	2307
	Regulus W.	70 2 51	2281	71 49 18	2277	73 35 52	2272	75 22 32	2268
	MARS E.	51 15 34	2436	49 32 51	2431	47 50 1	2427	46 7 5	2424

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to		Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.		Subtracted from Apparent Time.		
		h m s	s	° ' "	"	' "	s	m s	s	
Mon.	1	0 39 1.33	9.094	N. 4 12 14.5	+58.00	16 2.00	64.46	4 13.72	0.760	
Tues.	2	0 42 39.64	9.099	4 35 24.3	57.81	16 1.72	64.48	3 55.53	0.755	
Wed.	3	0 46 18.09	9.105	4 58 29.1	57.60	16 1.43	64.50	3 37.47	0.750	
Thur.	4	0 49 56.67	9.112	5 21 28.7	+57.38	16 1.15	64.52	3 19.55	0.743	
Frid.	5	0 53 35.42	9.119	5 44 22.8	57.14	16 0.87	64.54	3 1.81	0.736	
Sat.	6	0 57 14.36	9.127	6 7 11.0	56.89	16 0.59	64.57	2 44.24	0.728	
SUN.	7	1 0 53.51	9.136	6 29 53.1	+56.62	16 0.31	64.60	2 26.87	0.719	
Mon.	8	1 4 32.88	9.145	6 52 28.5	56.34	16 0.03	64.63	2 9.74	0.709	
Tues.	9	1 8 12.49	9.154	7 14 57.1	56.05	15 59.75	64.67	1 52.84	0.699	
Wed.	10	1 11 52.33	9.165	7 37 18.4	+55.73	15 59.47	64.71	1 36.17	0.688	
Thur.	11	1 15 32.45	9.176	7 59 32.0	55.40	15 59.20	64.75	1 19.79	0.677	
Frid.	12	1 19 12.85	9.188	8 21 37.6	55.05	15 58.93	64.79	1 3.68	0.665	
Sat.	13	1 22 53.54	9.201	8 43 35.0	+54.70	15 58.66	64.83	0 47.86	0.653	
SUN.	14	1 26 34.54	9.215	9 5 23.5	54.33	15 58.39	64.88	0 32.35	0.640	
Mon.	15	1 30 15.85	9.229	9 27 3.1	53.95	15 58.12	64.93	0 17.15	0.626	
Tues.	16	1 33 57.50	9.243	9 48 33.3	+53.54	15 57.86	64.98	0 2.28	0.613	
Wed.	17	1 37 39.48	9.258	10 9 53.7	53.13	15 57.59	65.03	0 12.26	0.598	
Thur.	18	1 41 21.83	9.273	10 31 4.0	52.69	15 57.33	65.08	0 26.43	0.583	
Frid.	19	1 45 4.54	9.288	10 52 3.8	+52.26	15 57.07	65.14	0 40.22	0.567	
Sat.	20	1 48 47.64	9.304	11 12 52.8	51.80	15 56.82	65.20	0 53.65	0.551	
SUN.	21	1 52 31.13	9.321	11 33 30.6	51.33	15 56.56	65.26	1 6.67	0.534	
Mon.	22	1 56 15.04	9.338	11 53 57.1	+50.84	15 56.31	65.33	1 19.28	0.517	
Tues.	23	1 59 59.35	9.356	12 14 11.7	50.35	15 56.06	65.39	1 31.48	0.499	
Wed.	24	2 3 44.12	9.375	12 34 14.2	49.84	15 55.81	65.46	1 43.24	0.481	
Thur.	25	2 7 29.33	9.394	12 54 4.2	+49.32	15 55.56	65.52	1 54.55	0.462	
Frid.	26	2 11 15.00	9.414	13 13 41.4	48.79	15 55.31	65.59	2 5.40	0.442	
Sat.	27	2 15 1.16	9.435	13 33 5.5	48.24	15 55.06	65.66	2 15.77	0.422	
SUN.	28	2 18 47.82	9.455	13 52 16.3	+47.67	15 54.82	65.74	2 25.65	0.401	
Mon.	29	2 22 34.97	9.476	14 11 13.4	47.10	15 54.57	65.81	2 35.02	0.380	
Tues.	30	2 26 22.64	9.498	14 29 56.5	46.51	15 54.33	65.89	2 43.88	0.358	
Wed.	31	2 30 10.86	9.520	N.14 48 25.4	+45.90	15 54.08	65.96	2 52.19	0.335	

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.18 from the sidereal time.  
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Added to Mean Time.		
Mon.	1	h m s 0 39 0.69	s 9.096	N. 4 12 10.5	" + 58.01	m s 4 13.77	s 0.760	h m s 0 34 46.92
Tues.	2	0 42 39.05	9.101	4 35 20.6	57.82	3 55.57	0.755	0 38 43.48
Wed.	3	0 46 17.54	9.107	4 58 25.7	57.61	3 37.51	0.750	0 42 40.03
Thur.	4	0 49 56.17	9.114	5 21 25.6	+ 57.39	3 19.59	0.743	0 46 36.58
Frid.	5	0 53 34.97	9.121	5 44 20.0	57.15	3 1.84	0.736	0 50 33.13
Sat.	6	0 57 13.95	9.129	6 7 8.5	56.90	2 44.27	0.728	0 54 29.68
SUN.	7	1 0 53.14	9.138	6 29 50.8	+ 56.63	2 26.90	0.719	0 58 26.24
Mon.	8	1 4 32.55	9.147	6 52 26.5	56.35	2 9.76	0.709	1 2 22.79
Tues.	9	1 8 12.20	9.156	7 14 55.3	56.06	1 52.86	0.699	1 6 19.34
Wed.	10	1 11 52.09	9.167	7 37 16.9	+ 55.74	1 36.19	0.688	1 10 15.90
Thur.	11	1 15 32.25	9.178	7 59 30.8	55.41	1 19.80	0.677	1 14 12.45
Frid.	12	1 19 12.69	9.190	8 21 36.7	55.06	1 3.69	0.665	1 18 9.00
Sat.	13	1 22 53.42	9.202	8 43 34.3	+ 54.71	0 47.86	0.653	1 22 5.56
SUN.	14	1 26 34.46	9.216	9 5 23.1	54.34	0 32.35	0.640	1 26 2.11
Mon.	15	1 30 15.81	9.230	9 27 2.9	53.96	0 17.15	0.626	1 29 58.66
Tues.	16	1 33 57.49	9.244	9 48 33.3	+ 53.55	0 2.28	0.613	1 33 55.21
Wed.	17	1 37 39.51	9.259	10 9 53.9	53.13	0 12.26	0.598	1 37 51.77
Thur.	18	1 41 21.89	9.274	10 31 4.4	52.70	0 26.43	0.583	1 41 48.32
Frid.	19	1 45 4.64	9.289	10 52 4.4	+ 52.27	0 40.23	0.567	1 45 44.87
Sat.	20	1 48 47.77	9.305	11 12 53.6	51.81	0 53.66	0.551	1 49 41.43
SUN.	21	1 52 31.30	9.322	11 33 31.6	51.34	1 6.68	0.534	1 53 37.98
Mon.	22	1 56 15.24	9.339	11 53 58.2	+ 50.85	1 19.29	0.517	1 57 34.53
Tues.	23	1 59 59.59	9.357	12 14 13.0	50.36	1 31.49	0.499	2 1 31.08
Wed.	24	2 3 44.39	9.376	12 34 15.6	49.85	1 43.25	0.481	2 5 27.64
Thur.	25	2 7 29.63	9.395	12 54 5.7	+ 49.33	1 54.57	0.462	2 9 24.20
Frid.	26	2 11 15.33	9.415	13 13 43.0	48.79	2 5.42	0.442	2 13 20.75
Sat.	27	2 15 1.51	9.436	13 33 7.3	48.24	2 15.79	0.422	2 17 17.30
SUN.	28	2 18 48.19	9.456	13 52 18.2	+ 47.67	2 25.67	0.401	2 21 13.86
Mon.	29	2 22 35.37	9.477	14 11 15.4	47.10	2 35.04	0.380	2 25 10.41
Tues.	30	2 26 23.07	9.499	14 29 58.6	46.51	2 43.90	0.358	2 29 6.97
Wed.	31	2 30 11.31	9.521	N. 14 48 27.5	+ 45.90	2 52.21	0.335	2 33 3.52

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour,  
+0°.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
		$^{\circ}$ $'$ $''$	$'$ $''$	$''$	$^{\circ}$			$^h$ $^m$ $^s$
1	91	10 37 3.3	37 6.5	147.92	+ 0.87	9.999 7729	+ 52.9	23 21 22.87
2	92	11 36 12.6	36 15.7	147.84	0.81	9.999 9001	53.1	23 17 26.96
3	93	12 35 20.0	35 23.0	147.77	0.74	0.000 0276	53.2	23 13 31.05
4	94	13 34 25.7	34 28.6	147.70	+ 0.63	0.000 1554	+ 53.3	23 9 35.15
5	95	14 33 29.6	33 32.4	147.63	0.50	0.000 2833	53.2	23 5 39.24
6	96	15 32 31.9	32 34.6	147.57	0.36	0.000 4109	53.1	23 1 43.33
7	97	16 31 32.4	31 35.0	147.51	+ 0.22	0.000 5383	+ 53.0	22 57 47.43
8	98	17 30 31.1	30 33.6	147.43	+ 0.10	0.000 6652	52.7	22 53 51.52
9	99	18 29 28.1	29 30.5	147.34	— 0.02	0.000 7914	52.4	22 49 55.61
10	100	19 28 23.2	28 25.6	147.26	— 0.12	0.000 9169	+ 52.1	22 45 59.71
11	101	20 27 16.5	27 18.8	147.18	0.19	0.001 0415	51.7	22 42 3.80
12	102	21 26 7.8	26 10.0	147.10	0.23	0.001 1651	51.3	22 38 7.89
13	103	22 24 57.2	24 59.2	147.02	— 0.26	0.001 2878	+ 50.9	22 34 11.98
14	104	23 23 44.5	23 46.5	146.93	0.24	0.001 4094	50.5	22 30 16.08
15	105	24 22 29.8	22 31.6	146.84	0.19	0.001 5300	50.0	22 26 20.17
16	106	25 21 12.9	21 14.7	146.75	— 0.14	0.001 6496	+ 49.6	22 22 24.26
17	107	26 19 53.9	19 55.6	146.66	— 0.05	0.001 7682	49.2	22 18 28.36
18	108	27 18 32.8	18 34.3	146.57	+ 0.06	0.001 8860	48.9	22 14 32.45
19	109	28 17 9.5	17 10.9	146.48	+ 0.16	0.002 0029	+ 48.6	22 10 36.54
20	110	29 15 44.0	15 45.3	146.39	0.27	0.002 1191	48.3	22 6 40.63
21	111	30 14 16.3	14 17.5	146.30	0.39	0.002 2345	48.0	22 2 44.73
22	112	31 12 46.5	12 47.6	146.21	+ 0.51	0.002 3492	+ 47.7	21 58 48.82
23	113	32 11 14.5	11 15.5	146.12	0.61	0.002 4634	47.5	21 54 52.91
24	114	33 9 40.4	9 41.3	146.03	0.69	0.002 5770	47.3	21 50 57.00
25	115	34 8 4.2	8 5.0	145.95	+ 0.76	0.002 6903	+ 47.1	21 47 1.09
26	116	35 6 26.0	6 26.6	145.87	0.81	0.002 8032	47.0	21 43 5.18
27	117	36 4 45.8	4 46.3	145.79	0.80	0.002 9158	46.9	21 39 9.28
28	118	37 3 3.7	3 4.2	145.71	+ 0.78	0.003 0281	+ 46.8	21 35 13.37
29	119	38 1 19.9	1 20.2	145.64	0.73	0.003 1402	46.6	21 31 17.46
30	120	38 59 34.4	59 34.6	145.57	0.65	0.003 2519	46.5	21 27 21.55
31	121	39 57 47.2	57 47.3	145.51	+ 0.54	0.003 3632	+ 46.3	21 23 25.64
NOTE.—The longitudes in the column $\lambda$ are referred to the true equinox of their own date, while those in the column $\lambda'$ are referred to the mean equinox of the beginning of the Besselian fictitious year.								Diff. for 1 Hour, — $9^s.8296$ . (Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
1	16 11.0	16 12.6	59 17.8	+ 0.60	59 23.8	+ 0.41	14 56.3	2.29	18.2
2	16 13.7	16 14.2	59 27.7	+ 0.23	59 29.5	+ 0.07	15 52.3	2.38	19.2
3	16 14.1	16 13.6	59 29.3	- 0.08	59 27.4	- 0.23	16 50.4	2.45	20.2
4	16 12.7	16 11.3	59 23.9	- 0.35	59 19.0	- 0.45	17 49.6	2.46	21.2
5	16 9.7	16 7.7	59 12.9	0.55	59 5.7	0.65	18 48.5	2.42	22.2
6	16 5.5	16 3.0	58 57.5	0.72	58 48.4	0.79	19 45.8	2.33	23.2
7	16 0.3	15 57.4	58 38.5	- 0.85	58 27.9	- 0.92	20 40.5	2.22	24.2
8	15 54.3	15 51.0	58 16.5	0.98	58 4.4	1.03	21 32.4	2.11	25.2
9	15 47.5	15 43.9	57 51.6	1.09	57 38.2	1.15	22 21.8	2.01	26.2
10	15 40.0	15 36.0	57 24.1	- 1.20	57 9.4	- 1.24	23 9.2	1.95	27.2
11	15 31.8	15 27.7	56 54.3	1.28	56 38.8	1.30	23 55.3	1.90	28.2
12	15 23.4	15 19.1	56 23.0	1.31	56 7.2	1.31	6	.	29.2
13	15 14.9	15 10.7	55 51.6	- 1.29	55 36.3	- 1.25	0 40.7	1.90	0.7
14	15 6.7	15 2.9	55 21.5	1.20	55 7.5	1.12	1 26.1	1.93	1.7
15	14 59.3	14 56.2	54 54.6	1.03	54 42.9	0.90	2 12.1	1.96	2.7
16	14 53.4	14 51.1	54 32.8	- 0.77	54 24.4	- 0.62	2 58.7	1.99	3.7
17	14 49.4	14 48.2	54 17.9	0.45	54 13.5	- 0.28	3 46.1	2.01	4.7
18	14 47.6	14 47.6	54 11.3	- 0.08	54 11.5	+ 0.12	4 34.3	2.02	5.7
19	14 48.3	14 49.8	54 14.2	+ 0.33	54 19.5	+ 0.54	5 22.9	2.02	6.7
20	14 51.9	14 54.7	54 27.2	0.75	54 37.6	0.96	6 11.4	2.02	7.7
21	14 58.1	15 2.4	54 50.4	1.17	55 5.8	1.37	6 59.6	2.00	8.7
22	15 7.2	15 12.5	55 23.4	+ 1.55	55 43.1	+ 1.72	7 47.4	1.98	9.7
23	15 18.4	15 24.7	56 4.6	1.86	56 27.7	1.97	8 34.9	1.98	10.7
24	15 31.3	15 38.1	56 51.9	2.05	57 16.9	2.09	9 22.4	1.99	11.7
25	15 45.0	15 51.8	57 42.1	+ 2.10	58 7.2	+ 2.05	10 10.4	2.03	12.7
26	15 58.4	16 4.6	58 31.6	1.96	58 54.4	1.83	10 59.6	2.09	13.7
27	16 10.3	16 15.5	59 15.5	1.66	59 34.2	1.44	11 50.8	2.19	14.7
28	16 19.8	16 23.2	59 50.0	+ 1.19	60 2.7	+ 0.91	12 44.7	2.31	15.7
29	16 25.7	16 27.3	60 12.1	0.63	60 17.8	+ 0.33	13 41.5	2.42	16.7
30	16 27.9	16 27.6	60 19.9	+ 0.04	60 18.7	- 0.23	14 40.9	2.51	17.7
31	16 26.4	16 24.3	60 14.2	- 0.49	60 6.8	- 0.73	15 41.9	2.54	18.7

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 1.					WEDNESDAY 3.				
0	14 58 36.69	2.3097	S. 11 54 20.3	10.950	0	16 53 43.87	2.4801	S. 18 58 29.5	6.262
1	15 0 55.38	2.3134	12 5 15.3	10.882	1	16 56 12.76	2.4829	19 4 41.5	6.137
2	15 3 14.30	2.3172	12 16 6.1	10.812	2	16 58 41.82	2.4857	19 10 46.0	6.012
3	15 5 33.44	2.3209	12 26 52.7	10.742	3	17 1 11.04	2.4883	19 16 42.9	5.885
4	15 7 52.81	2.3247	12 37 35.1	10.670	4	17 3 40.42	2.4909	19 22 32.2	5.758
5	15 10 12.40	2.3284	12 48 13.1	10.597	5	17 6 9.95	2.4935	19 28 13.9	5.630
6	15 12 32.22	2.3322	12 58 46.7	10.522	6	17 8 39.64	2.4960	19 33 47.8	5.501
7	15 14 52.26	2.3359	13 9 15.7	10.445	7	17 11 9.47	2.4984	19 39 14.0	5.372
8	15 17 12.53	2.3397	13 19 40.1	10.368	8	17 13 39.45	2.5008	19 44 32.4	5.241
9	15 19 33.02	2.3434	13 29 59.9	10.290	9	17 16 9.57	2.5032	19 49 42.9	5.109
10	15 21 53.74	2.3472	13 40 14.9	10.210	10	17 18 39.83	2.5054	19 54 45.6	4.978
11	15 24 14.69	2.3511	13 50 25.1	10.128	11	17 21 10.22	2.5075	19 59 40.3	4.845
12	15 26 35.87	2.3549	14 0 30.3	10.045	12	17 23 40.73	2.5096	20 4 27.0	4.712
13	15 28 57.28	2.3587	14 10 30.5	9.961	13	17 26 11.37	2.5117	20 9 5.7	4.578
14	15 31 18.91	2.3624	14 20 25.6	9.876	14	17 28 42.13	2.5136	20 13 36.4	4.444
15	15 33 40.77	2.3662	14 30 15.6	9.789	15	17 31 13.00	2.5155	20 17 59.0	4.309
16	15 36 2.86	2.3701	14 40 0.3	9.702	16	17 33 43.99	2.5173	20 22 13.5	4.173
17	15 38 25.18	2.3738	14 49 39.8	9.612	17	17 36 15.08	2.5190	20 26 19.8	4.037
18	15 40 47.72	2.3775	14 59 13.8	9.521	18	17 38 46.27	2.5209	20 30 17.9	3.900
19	15 43 10.48	2.3813	15 8 42.3	9.429	19	17 41 17.56	2.5222	20 34 7.8	3.762
20	15 45 33.48	2.3852	15 18 5.3	9.337	20	17 43 48.94	2.5237	20 37 49.4	3.625
21	15 47 56.70	2.3888	15 27 22.7	9.242	21	17 46 20.41	2.5252	20 41 22.8	3.487
22	15 50 20.14	2.3925	15 36 34.4	9.147	22	17 48 51.96	2.5265	20 44 47.8	3.347
23	15 52 43.80	2.3962	S. 15 45 40.4	9.051	23	17 51 23.59	2.5277	S. 20 48 4.5	3.209
TUESDAY 2.					THURSDAY 4.				
0	15 55 7.69	2.4000	S. 15 54 40.5	8.952	0	17 53 55.29	2.5289	S. 20 51 12.9	3.070
1	15 57 31.80	2.4037	16 3 34.7	8.853	1	17 56 27.06	2.5300	20 54 12.9	2.929
2	15 59 56.14	2.4074	16 12 22.9	8.752	2	17 58 58.89	2.5310	20 57 4.4	2.788
3	16 2 20.69	2.4110	16 21 5.0	8.651	3	18 1 30.78	2.5319	20 59 47.5	2.647
4	16 4 45.46	2.4147	16 29 41.0	8.548	4	18 4 2.72	2.5327	21 2 22.1	2.506
5	16 7 10.45	2.4182	16 38 10.8	8.444	5	18 6 34.70	2.5334	21 4 48.2	2.365
6	16 9 35.65	2.4217	16 46 34.3	8.339	6	18 9 6.73	2.5342	21 7 5.9	2.223
7	16 12 1.06	2.4253	16 54 51.5	8.233	7	18 11 38.80	2.5348	21 9 15.0	2.082
8	16 14 26.69	2.4289	17 3 2.3	8.126	8	18 14 10.90	2.5352	21 11 15.7	1.940
9	16 16 52.53	2.4323	17 11 6.6	8.017	9	18 16 43.02	2.5356	21 13 7.8	1.797
10	16 19 18.57	2.4358	17 19 4.4	7.907	10	18 19 15.17	2.5359	21 14 51.3	1.654
11	16 21 44.82	2.4392	17 26 55.5	7.797	11	18 21 47.33	2.5361	21 16 26.3	1.512
12	16 24 11.28	2.4427	17 34 40.0	7.685	12	18 24 19.50	2.5362	21 17 52.8	1.370
13	16 26 37.94	2.4460	17 42 17.7	7.572	13	18 26 51.68	2.5362	21 19 10.7	1.227
14	16 29 4.80	2.4493	17 49 48.6	7.457	14	18 29 23.85	2.5362	21 20 20.0	1.083
15	16 31 31.86	2.4526	17 57 12.6	7.342	15	18 31 56.02	2.5361	21 21 20.7	0.941
16	16 33 59.11	2.4558	18 4 29.7	7.227	16	18 34 28.18	2.5357	21 22 12.9	0.797
17	16 36 26.56	2.4591	18 11 39.8	7.109	17	18 37 0.31	2.5354	21 22 56.4	0.654
18	16 38 54.20	2.4622	18 18 42.8	6.991	18	18 39 32.43	2.5351	21 23 31.4	0.512
19	16 41 22.02	2.4652	18 25 38.7	6.872	19	18 42 4.52	2.5346	21 23 57.8	0.369
20	16 43 50.03	2.4684	18 32 27.5	6.752	20	18 44 36.58	2.5339	21 24 15.7	0.226
21	16 46 18.23	2.4714	18 39 9.0	6.631	21	18 47 8.59	2.5332	21 24 24.9	-0.083
22	16 48 46.60	2.4743	18 45 43.2	6.509	22	18 49 40.56	2.5324	21 24 25.6	+0.060
23	16 51 15.15	2.4772	18 52 10.1	6.386	23	18 52 12.48	2.5316	21 24 17.7	0.202
24	16 53 43.87	2.4801	S. 18 58 29.5	6.262	24	18 54 44.35	2.5307	S. 21 24 1.3	0.345

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 5.					SUNDAY 7.				
0	18 54 44.35	2.5307	S. 21 24 1.3	0.345	0	20 53 35.37	2.3968	S. 18 31 46.4	6.575
1	18 57 16.16	2.5296	21 23 36.3	0.487	1	20 55 59.02	2.3922	18 25 8.6	6.685
2	18 59 47.90	2.5284	21 23 2.9	0.628	2	20 58 22.43	2.3881	18 18 24.2	6.794
3	19 2 19.57	2.5272	21 22 20.9	0.771	3	21 0 45.59	2.3838	18 11 33.3	6.902
4	19 4 51.16	2.5258	21 21 30.4	0.912	4	21 3 8.49	2.3797	18 4 36.0	7.008
5	19 7 22.67	2.5245	21 20 31.4	1.053	5	21 5 31.15	2.3755	17 57 32.3	7.115
6	19 9 54.10	2.5230	21 19 24.0	1.193	6	21 7 53.55	2.3712	17 50 22.2	7.220
7	19 12 25.43	2.5214	21 18 8.2	1.334	7	21 10 15.69	2.3669	17 43 5.9	7.323
8	19 14 56.67	2.5197	21 16 43.9	1.475	8	21 12 37.58	2.3626	17 35 43.4	7.426
9	19 17 27.80	2.5180	21 15 11.2	1.615	9	21 14 59.20	2.3582	17 28 14.8	7.527
10	19 19 58.83	2.5162	21 13 30.1	1.754	10	21 17 20.57	2.3540	17 20 40.1	7.628
11	19 22 29.74	2.5148	21 11 40.7	1.892	11	21 19 41.68	2.3497	17 12 59.4	7.727
12	19 25 0.54	2.5123	21 9 43.0	2.031	12	21 22 2.53	2.3453	17 5 12.8	7.826
13	19 27 31.22	2.5102	21 7 37.0	2.169	13	21 24 23.12	2.3409	16 57 20.3	7.923
14	19 30 1.77	2.5081	21 5 22.7	2.307	14	21 26 43.44	2.3366	16 49 22.0	8.019
15	19 32 32.19	2.5058	21 3 0.1	2.445	15	21 29 3.51	2.3322	16 41 18.0	8.113
16	19 35 2.47	2.5035	21 0 29.3	2.582	16	21 31 23.31	2.3277	16 33 8.4	8.207
17	19 37 32.61	2.5012	20 57 50.3	2.717	17	21 33 42.84	2.3233	16 24 53.1	8.301
18	19 40 2.61	2.4987	20 55 3.2	2.852	18	21 36 2.11	2.3190	16 16 32.3	8.392
19	19 42 32.45	2.4961	20 52 8.0	2.987	19	21 38 21.12	2.3147	16 8 6.0	8.482
20	19 45 2.14	2.4936	20 49 4.7	3.122	20	21 40 39.87	2.3102	15 59 34.4	8.572
21	19 47 31.68	2.4909	20 45 53.4	3.256	21	21 42 58.35	2.3057	15 50 57.4	8.660
22	19 50 1.05	2.4881	20 42 34.0	3.389	22	21 45 16.56	2.3013	15 42 15.2	8.747
23	19 52 30.25	2.4852	S. 20 39 6.7	3.522	23	21 47 34.51	2.2970	S. 15 33 27.8	8.833
SATURDAY 6.					MONDAY 8.				
0	19 54 59.28	2.4824	S. 20 35 31.4	3.653	0	21 49 52.20	2.2926	S. 15 24 35.2	8.918
1	19 57 28.14	2.4795	20 31 48.3	3.784	1	21 52 9.62	2.2882	15 15 37.6	9.001
2	19 59 56.82	2.4764	20 27 57.3	3.915	2	21 54 26.78	2.2838	15 6 35.1	9.083
3	20 2 25.31	2.4733	20 23 58.5	4.045	3	21 56 43.68	2.2794	14 57 27.7	9.164
4	20 4 53.62	2.4702	20 19 51.9	4.174	4	21 59 0.31	2.2750	14 48 15.4	9.244
5	20 7 21.74	2.4670	20 15 37.6	4.302	5	22 1 16.68	2.2707	14 38 58.4	9.322
6	20 9 49.66	2.4637	20 11 15.6	4.429	6	22 3 32.79	2.2663	14 29 36.7	9.400
7	20 12 17.38	2.4603	20 6 46.1	4.556	7	22 5 48.64	2.2620	14 20 10.4	9.477
8	20 14 44.90	2.4570	20 2 8.9	4.682	8	22 8 4.23	2.2577	14 10 39.5	9.552
9	20 17 12.22	2.4536	19 57 24.2	4.807	9	22 10 19.56	2.2533	14 1 4.2	9.626
10	20 19 39.33	2.4501	19 52 32.0	4.932	10	22 12 34.63	2.2491	13 51 24.4	9.699
11	20 22 6.23	2.4465	19 47 32.4	5.054	11	22 14 49.45	2.2448	13 41 40.3	9.771
12	20 24 32.91	2.4429	19 42 25.5	5.177	12	22 17 4.01	2.2405	13 31 51.9	9.842
13	20 26 59.38	2.4392	19 37 11.2	5.299	13	22 19 18.31	2.2362	13 21 59.3	9.911
14	20 29 25.62	2.4355	19 31 49.6	5.420	14	22 21 32.36	2.2320	13 12 2.6	9.978
15	20 31 51.64	2.4318	19 26 20.8	5.539	15	22 23 46.15	2.2278	13 2 1.9	10.045
16	20 34 17.44	2.4280	19 20 44.9	5.657	16	22 25 59.70	2.2237	12 51 57.2	10.112
17	20 36 43.00	2.4242	19 15 1.9	5.776	17	22 28 12.99	2.2194	12 41 48.5	10.177
18	20 39 8.34	2.4203	19 9 11.8	5.893	18	22 30 26.03	2.2153	12 31 36.0	10.239
19	20 41 33.44	2.4164	19 3 14.7	6.009	19	22 32 38.83	2.2112	12 21 19.8	10.302
20	20 43 58.31	2.4124	18 57 10.7	6.124	20	22 34 51.38	2.2072	12 10 59.8	10.363
21	20 46 22.93	2.4084	18 50 59.8	6.238	21	22 37 3.69	2.2031	12 0 36.2	10.423
22	20 48 47.32	2.4045	18 44 42.1	6.352	22	22 39 15.75	2.1991	11 50 9.0	10.482
23	20 51 11.47	2.4004	18 38 17.6	6.464	23	22 41 27.58	2.1951	11 39 38.4	10.539
24	20 53 35.37	2.3962	S. 18 31 46.4	6.575	24	22 43 39.16	2.1910	S. 11 29 4.3	10.596

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 9.					THURSDAY 11.				
0	22 43 39.16	2.1910	S. 11 29 4.3	10.596	0	0 24 55.27	2.0442	S. 2 17 20.1	11.969
1	22 45 50.50	2.1871	11 18 26.9	10.651	1	0 26 57.86	2.0422	2 5 21.9	11.972
2	22 48 1.61	2.1832	11 7 46.2	10.704	2	0 29 0.34	2.0403	1 53 23.5	11.973
3	22 50 12.48	2.1792	10 57 2.4	10.757	3	0 31 2.70	2.0383	1 41 25.1	11.973
4	22 52 23.12	2.1754	10 46 15.4	10.809	4	0 33 4.94	2.0364	1 29 26.7	11.972
5	22 54 33.53	2.1716	10 35 25.3	10.860	5	0 35 7.07	2.0347	1 17 28.4	11.971
6	22 56 43.71	2.1678	10 24 32.2	10.909	6	0 37 9.10	2.0329	1 5 30.2	11.968
7	22 58 53.67	2.1641	10 13 36.2	10.957	7	0 39 11.02	2.0311	0 53 32.2	11.965
8	23 1 3.40	2.1603	10 2 37.3	11.004	8	0 41 12.83	2.0294	0 41 34.4	11.960
9	23 3 12.91	2.1566	9 51 35.7	11.049	9	0 43 14.55	2.0278	0 29 37.0	11.954
10	23 5 22.19	2.1529	9 40 31.4	11.094	10	0 45 16.17	2.0262	0 17 39.9	11.948
11	23 7 31.26	2.1494	9 29 24.4	11.138	11	0 47 17.70	2.0247	S. 0 5 43.2	11.941
12	23 9 40.12	2.1458	9 18 14.8	11.181	12	0 49 19.14	2.0232	N. 0 6 13.0	11.932
13	23 11 48.76	2.1422	9 7 2.7	11.222	13	0 51 20.49	2.0217	0 18 8.7	11.923
14	23 13 57.19	2.1387	8 55 48.2	11.262	14	0 53 21.75	2.0202	0 30 3.8	11.912
15	23 16 5.40	2.1352	8 44 31.3	11.301	15	0 55 22.92	2.0188	0 41 58.2	11.901
16	23 18 13.41	2.1318	8 33 12.1	11.338	16	0 57 24.01	2.0176	0 53 51.9	11.889
17	23 20 21.22	2.1285	8 21 50.7	11.375	17	0 59 25.03	2.0163	1 5 44.9	11.876
18	23 22 28.83	2.1251	8 10 27.1	11.411	18	1 1 25.97	2.0150	1 17 37.0	11.862
19	23 24 36.23	2.1217	7 59 1.4	11.446	19	1 3 26.83	2.0138	1 29 28.3	11.847
20	23 26 43.44	2.1185	7 47 33.6	11.479	20	1 5 27.63	2.0127	1 41 18.6	11.831
21	23 28 50.45	2.1152	7 36 3.9	11.511	21	1 7 28.36	2.0116	1 53 8.0	11.814
22	23 30 57.27	2.1121	7 24 32.3	11.542	22	1 9 29.02	2.0106	2 4 56.3	11.796
23	23 33 3.90	2.1089	S. 7 12 58.9	11.572	23	1 11 29.63	2.0096	N. 2 16 43.5	11.777
WEDNESDAY 10.					FRIDAY 12.				
0	23 35 10.34	2.1057	S. 7 1 23.7	11.601	0	1 13 30.17	2.0085	N. 2 28 29.6	11.758
1	23 37 16.59	2.1027	6 49 46.8	11.628	1	1 15 30.65	2.0076	2 40 14.5	11.737
2	23 39 22.67	2.0997	6 38 8.3	11.654	2	1 17 31.08	2.0067	2 51 58.1	11.716
3	23 41 28.56	2.0967	6 26 28.3	11.680	3	1 19 31.45	2.0058	3 3 40.4	11.694
4	23 43 34.27	2.0937	6 14 46.7	11.705	4	1 21 31.78	2.0051	3 15 21.4	11.671
5	23 45 39.81	2.0908	6 3 3.7	11.728	5	1 23 32.06	2.0042	3 27 0.9	11.647
6	23 47 45.17	2.0880	5 51 19.3	11.750	6	1 25 32.29	2.0035	3 38 39.0	11.622
7	23 49 50.37	2.0852	5 39 33.7	11.771	7	1 27 32.48	2.0028	3 50 15.5	11.596
8	23 51 55.40	2.0824	5 27 46.8	11.792	8	1 29 32.63	2.0022	4 1 50.5	11.570
9	23 54 0.26	2.0797	5 15 58.7	11.811	9	1 31 32.74	2.0016	4 13 23.9	11.542
10	23 56 4.96	2.0770	5 4 9.5	11.829	10	1 33 32.82	2.0010	4 24 55.6	11.514
11	23 58 9.50	2.0744	4 52 19.2	11.846	11	1 35 32.86	2.0005	4 36 25.6	11.485
12	0 0 13.89	2.0718	4 40 28.0	11.861	12	1 37 32.88	2.0000	4 47 53.8	11.455
13	0 2 18.12	2.0692	4 28 35.9	11.876	13	1 39 32.86	1.9995	4 59 20.2	11.424
14	0 4 22.20	2.0667	4 16 42.9	11.889	14	1 41 32.82	1.9992	5 10 44.7	11.392
15	0 6 26.13	2.0643	4 4 49.2	11.902	15	1 43 32.76	1.9988	5 22 7.3	11.360
16	0 8 29.92	2.0619	3 52 54.7	11.913	16	1 45 32.68	1.9985	5 33 27.9	11.327
17	0 10 33.56	2.0595	3 40 59.6	11.924	17	1 47 32.58	1.9982	5 44 46.5	11.292
18	0 12 37.06	2.0572	3 29 3.8	11.934	18	1 49 32.46	1.9978	5 56 3.0	11.257
19	0 14 40.42	2.0549	3 17 7.5	11.942	19	1 51 32.32	1.9977	6 7 17.4	11.222
20	0 16 43.65	2.0527	3 5 10.8	11.949	20	1 53 32.18	1.9975	6 18 29.6	11.185
21	0 18 46.75	2.0506	2 53 13.6	11.957	21	1 55 32.02	1.9973	6 29 39.6	11.147
22	0 20 49.72	2.0484	2 41 16.0	11.962	22	1 57 31.86	1.9972	6 40 47.3	11.110
23	0 22 52.56	2.0462	2 29 18.2	11.966	23	1 59 31.69	1.9972	6 51 52.8	11.071
24	0 24 55.27	2.0442	S. 2 17 20.1	11.969	24	2 1 31.52	1.9972	N. 7 2 55.8	11.030



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 13.					MONDAY 15.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
0	2 1 31.52	1.9972	7 2 55.8	11.030	0	3 37 56.07	2.0394	14 52 46.0	8.287
1	2 3 31.35	1.9972	7 13 56.4	10.990	1	3 39 57.87	2.0307	15 1 1.1	8.216
2	2 5 31.18	1.9972	7 24 54.6	10.949	2	3 41 59.75	2.0319	15 9 11.9	8.143
3	2 7 31.02	1.9973	7 35 50.3	10.907	3	3 44 1.70	2.0331	15 17 18.3	8.069
4	2 9 30.86	1.9973	7 46 43.5	10.864	4	3 46 3.72	2.0342	15 25 20.2	7.994
5	2 11 30.70	1.9975	7 57 34.0	10.820	5	3 48 5.81	2.0355	15 33 17.6	7.920
6	2 13 30.56	1.9977	8 8 21.9	10.776	6	3 50 7.98	2.0367	15 41 10.6	7.845
7	2 15 30.43	1.9979	8 19 7.1	10.731	7	3 52 10.22	2.0380	15 48 59.0	7.768
8	2 17 30.31	1.9981	8 29 49.6	10.685	8	3 54 12.54	2.0392	15 56 42.8	7.692
9	2 19 30.20	1.9983	8 40 29.3	10.638	9	3 56 14.93	2.0404	16 4 22.1	7.616
10	2 21 30.11	1.9987	8 51 6.2	10.591	10	3 58 17.39	2.0417	16 11 56.7	7.538
11	2 23 30.05	1.9991	9 1 40.2	10.542	11	4 0 19.93	2.0430	16 19 26.7	7.460
12	2 25 30.00	1.9994	9 12 11.3	10.494	12	4 2 22.55	2.0443	16 26 51.9	7.382
13	2 27 29.98	1.9998	9 22 39.5	10.445	13	4 4 25.25	2.0456	16 34 12.5	7.303
14	2 29 29.98	2.0002	9 33 4.7	10.394	14	4 6 28.02	2.0468	16 41 28.3	7.223
15	2 31 30.01	2.0007	9 43 26.8	10.342	15	4 8 30.87	2.0482	16 48 39.3	7.143
16	2 33 30.07	2.0012	9 53 45.8	10.291	16	4 10 33.80	2.0495	16 55 45.5	7.063
17	2 35 30.15	2.0017	10 4 1.7	10.239	17	4 12 36.81	2.0508	17 2 46.9	6.982
18	2 37 30.27	2.0023	10 14 14.5	10.186	18	4 14 39.90	2.0521	17 9 43.4	6.902
19	2 39 30.43	2.0029	10 24 24.0	10.132	19	4 16 43.06	2.0534	17 16 35.1	6.820
20	2 41 30.62	2.0034	10 34 30.3	10.077	20	4 18 46.31	2.0547	17 23 21.8	6.737
21	2 43 30.84	2.0041	10 44 33.3	10.022	21	4 20 49.63	2.0560	17 30 3.5	6.654
22	2 45 31.11	2.0048	10 54 33.0	9.967	22	4 22 53.03	2.0572	17 36 40.3	6.572
23	2 47 31.41	2.0054	N. 11 4 29.3	9.910	23	4 24 56.50	2.0586	N. 17 43 12.1	6.488
SUNDAY 14.					TUESDAY 16.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
0	2 49 31.76	2.0062	N. 11 14 22.2	9.852	0	4 27 0.06	2.0600	N. 17 49 38.9	6.404
1	2 51 32.15	2.0068	11 24 11.6	9.794	1	4 29 3.70	2.0612	17 56 0.6	6.320
2	2 53 32.58	2.0076	11 33 57.5	9.736	2	4 31 7.41	2.0625	18 2 17.3	6.235
3	2 55 33.06	2.0084	11 43 39.9	9.677	3	4 33 11.20	2.0638	18 8 28.8	6.149
4	2 57 33.59	2.0092	11 53 18.7	9.617	4	4 35 15.07	2.0652	18 14 35.2	6.063
5	2 59 34.17	2.0101	12 2 53.9	9.557	5	4 37 19.02	2.0665	18 20 36.4	5.977
6	3 1 34.80	2.0108	12 12 25.5	9.495	6	4 39 23.05	2.0678	18 26 32.5	5.892
7	3 3 35.47	2.0117	12 21 53.3	9.432	7	4 41 27.16	2.0691	18 32 23.4	5.804
8	3 5 36.20	2.0127	12 31 17.4	9.371	8	4 43 31.34	2.0703	18 38 9.0	5.717
9	3 7 36.99	2.0136	12 40 37.8	9.308	9	4 45 35.60	2.0716	18 43 49.4	5.630
10	3 9 37.83	2.0145	12 49 54.4	9.244	10	4 47 39.93	2.0728	18 49 24.6	5.542
11	3 11 38.73	2.0154	12 59 7.1	9.179	11	4 49 44.34	2.0742	18 54 54.4	5.452
12	3 13 39.68	2.0164	13 8 15.9	9.114	12	4 51 48.83	2.0754	19 0 18.9	5.364
13	3 15 40.70	2.0174	13 17 20.8	9.049	13	4 53 53.39	2.0767	19 5 38.1	5.275
14	3 17 41.77	2.0184	13 26 21.8	8.983	14	4 55 58.03	2.0779	19 10 51.9	5.185
15	3 19 42.91	2.0195	13 35 18.8	8.916	15	4 58 2.74	2.0791	19 16 0.3	5.095
16	3 21 44.11	2.0205	13 44 11.7	8.848	16	5 0 7.52	2.0803	19 21 3.3	5.005
17	3 23 45.37	2.0216	13 53 0.6	8.781	17	5 2 12.38	2.0816	19 26 0.9	4.915
18	3 25 46.70	2.0227	14 1 45.4	8.712	18	5 4 17.31	2.0827	19 30 53.1	4.824
19	3 27 48.09	2.0237	14 10 26.0	8.642	19	5 6 22.31	2.0839	19 35 39.8	4.732
20	3 29 49.55	2.0249	14 19 2.5	8.573	20	5 8 27.38	2.0852	19 40 21.0	4.641
21	3 31 51.08	2.0260	14 27 34.8	8.502	21	5 10 32.53	2.0863	19 44 56.7	4.548
22	3 33 52.67	2.0272	14 36 2.8	8.432	22	5 12 37.74	2.0874	19 49 26.8	4.456
23	3 35 54.34	2.0283	14 44 26.6	8.360	23	5 14 43.02	2.0886	19 53 51.4	4.364
24	3 37 56.07	2.0294	N. 14 52 46.0	8.287	24	5 16 48.37	2.0897	N. 19 58 10.5	4.272

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 17.					FRIDAY 19.				
0	h m s		N. 19 58 10.5	4.272	0	h m s		N. 21 31 47.6	0.430
1	5 16 48.37	2.0897	20 2 24.0	4.177	1	6 58 4.38	2.1216	21 31 18.8	0.531
2	5 18 53.79	2.0908	20 6 31.8	4.084	2	7 0 11.68	2.1217	21 30 43.9	0.632
3	5 20 59.27	2.0919	20 10 34.1	3.991	3	7 2 18.99	2.1218	21 30 3.0	0.732
4	5 23 4.82	2.0931	20 14 30.7	3.896	4	7 4 26.30	2.1218	21 29 16.1	0.832
5	5 25 10.44	2.0942	20 18 21.6	3.802	5	7 6 33.61	2.1219	21 28 23.2	0.932
6	5 27 16.12	2.0952	20 22 6.9	3.707	6	7 8 40.93	2.1219	21 27 24.2	1.033
7	5 29 21.86	2.0962	20 25 46.5	3.612	7	7 10 48.24	2.1219	21 26 19.2	1.133
8	5 31 27.66	2.0972	20 29 20.4	3.517	8	7 12 55.56	2.1218	21 25 8.2	1.234
9	5 33 33.52	2.0982	20 32 48.6	3.422	9	7 15 2.87	2.1218	21 23 51.1	1.335
10	5 35 39.45	2.0992	20 36 11.1	3.327	10	7 17 10.18	2.1217	21 22 28.0	1.435
11	5 37 45.43	2.1002	20 39 27.8	3.231	11	7 19 17.49	2.1216	21 20 58.9	1.535
12	5 39 51.47	2.1011	20 42 38.8	3.135	12	7 21 24.79	2.1215	21 19 23.8	1.635
13	5 41 57.56	2.1020	20 45 44.0	3.038	13	7 23 32.08	2.1213	21 17 42.7	1.736
14	5 44 3.71	2.1030	20 48 43.4	2.942	14	7 25 39.37	2.1211	21 15 55.5	1.836
15	5 46 9.92	2.1039	20 51 37.0	2.845	15	7 27 46.64	2.1209	21 14 2.4	1.935
16	5 48 16.18	2.1047	20 54 24.8	2.748	16	7 29 53.90	2.1207	21 12 3.3	2.036
17	5 50 22.49	2.1057	20 57 6.8	2.651	17	7 32 1.15	2.1205	21 9 58.1	2.136
18	5 52 28.86	2.1065	20 59 42.9	2.553	18	7 34 8.39	2.1202	21 7 47.0	2.235
19	5 54 35.27	2.1073	21 2 13.2	2.456	19	7 36 15.61	2.1200	21 5 29.9	2.335
20	5 56 41.73	2.1081	21 4 37.6	2.358	20	7 38 22.82	2.1197	21 3 6.8	2.435
21	5 58 48.24	2.1088	21 6 56.2	2.261	21	7 40 30.01	2.1194	21 0 37.7	2.534
22	6 0 54.79	2.1096	21 9 8.9	2.162	22	7 42 37.18	2.1191	20 58 2.7	2.633
23	6 3 1.39	2.1103	N. 21 11 15.6	2.063	23	7 44 44.34	2.1187	N. 20 55 21.7	2.733
24	6 5 8.03	2.1111							
THURSDAY 18.					SATURDAY 20.				
0	6 7 14.72	2.1118	N. 21 13 16.5	1.966	0	7 48 58.58	2.1184	N. 20 52 34.7	2.832
1	6 9 21.45	2.1125	21 15 11.5	1.867	1	7 51 5.67	2.1179	20 49 41.8	2.931
2	6 11 28.22	2.1131	21 17 0.5	1.767	2	7 53 12.73	2.1175	20 46 43.0	3.029
3	6 13 35.02	2.1137	21 18 43.6	1.669	3	7 55 19.77	2.1172	20 43 38.3	3.128
4	6 15 41.87	2.1144	21 20 20.8	1.570	4	7 57 26.79	2.1167	20 40 27.6	3.227
5	6 17 48.75	2.1149	21 21 52.0	1.471	5	7 59 33.78	2.1162	20 37 11.0	3.325
6	6 19 55.66	2.1155	21 23 17.3	1.372	6	8 1 40.74	2.1157	20 33 48.6	3.423
7	6 22 2.61	2.1160	21 24 36.6	1.272	7	8 3 47.67	2.1152	20 30 20.2	3.521
8	6 24 9.58	2.1165	21 25 49.9	1.172	8	8 5 54.57	2.1148	20 26 46.0	3.619
9	6 26 16.59	2.1171	21 26 57.3	1.073	9	8 8 1.45	2.1144	20 23 5.9	3.717
10	6 28 23.63	2.1175	21 27 58.7	0.973	10	8 10 8.30	2.1138	20 19 19.9	3.815
11	6 30 30.69	2.1179	21 28 54.1	0.873	11	8 12 15.11	2.1132	20 15 28.1	3.912
12	6 32 37.78	2.1184	21 29 43.5	0.773	12	8 14 21.89	2.1127	20 11 30.5	4.008
13	6 34 44.90	2.1187	21 30 26.9	0.673	13	8 16 28.64	2.1122	20 7 27.1	4.106
14	6 36 52.03	2.1191	21 31 4.3	0.573	14	8 18 35.35	2.1116	20 3 17.8	4.203
15	6 38 59.19	2.1195	21 31 35.7	0.473	15	8 20 42.03	2.1110	19 59 2.7	4.299
16	6 41 6.37	2.1198	21 32 1.1	0.373	16	8 22 48.67	2.1103	19 54 41.9	4.395
17	6 43 13.57	2.1202	21 32 20.5	0.272	17	8 24 55.27	2.1097	19 50 15.3	4.492
18	6 45 20.79	2.1204	21 32 33.8	0.172	18	8 27 1.84	2.1092	19 45 42.9	4.587
19	6 47 28.02	2.1207	21 32 41.2	+ 0.072	19	8 29 8.38	2.1086	19 41 4.8	4.683
20	6 49 35.27	2.1209	21 32 42.5	- 0.028	20	8 31 14.87	2.1079	19 36 20.9	4.778
21	6 51 42.53	2.1211	21 32 37.8	0.128	21	8 33 21.33	2.1073	19 31 31.4	4.873
22	6 53 49.80	2.1213	21 32 27.1	0.228	22	8 35 27.75	2.1067	19 26 36.1	4.969
23	6 55 57.09	2.1215	21 32 10.4	0.329	23	8 37 34.13	2.1060	19 21 35.1	5.063
24	6 58 4.38	2.1216	N. 21 31 47.6	0.430	24	8 39 40.47	2.1053	N. 19 16 28.5	5.157

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 21.					TUESDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 39 40.47	2.1053	N. 19 16 28.5	5.157	0	10 19 59.81	2.0782	N. 13 26 27.1	9.273
1	8 41 46.77	2.1047	19 11 16.2	5.252	1	10 22 4.49	2.0779	13 17 8.5	9.347
2	8 43 53.03	2.1040	19 5 58.3	5.345	2	10 24 9.16	2.0777	13 7 45.4	9.422
3	8 45 59.25	2.1033	19 0 34.8	5.439	3	10 26 13.82	2.0775	12 58 17.8	9.497
4	8 48 5.43	2.1027	18 55 5.6	5.533	4	10 28 18.46	2.0773	12 48 45.8	9.569
5	8 50 11.57	2.1020	18 49 30.8	5.626	5	10 30 23.10	2.0772	12 39 9.5	9.642
6	8 52 17.67	2.1013	18 43 50.5	5.717	6	10 32 27.73	2.0772	12 29 28.8	9.713
7	8 54 23.73	2.1006	18 38 4.7	5.810	7	10 34 32.36	2.0772	12 19 43.9	9.785
8	8 56 29.74	2.0999	18 32 13.3	5.902	8	10 36 36.99	2.0771	12 9 54.6	9.856
9	8 58 35.72	2.0992	18 26 16.4	5.994	9	10 38 41.61	2.0770	12 0 1.2	9.926
10	9 0 41.65	2.0986	18 20 14.0	6.086	10	10 40 46.23	2.0770	11 50 3.5	9.996
11	9 2 47.55	2.0979	18 14 6.1	6.177	11	10 42 50.85	2.0771	11 40 1.7	10.064
12	9 4 53.40	2.0972	18 7 52.7	6.268	12	10 44 55.48	2.0772	11 29 55.8	10.132
13	9 6 59.21	2.0965	18 1 33.9	6.358	13	10 47 0.11	2.0772	11 19 45.8	10.200
14	9 9 4.98	2.0957	17 55 9.7	6.448	14	10 49 4.75	2.0774	11 9 31.8	10.267
15	9 11 10.70	2.0951	17 48 40.1	6.538	15	10 51 9.40	2.0776	10 59 13.7	10.334
16	9 13 16.39	2.0945	17 42 5.1	6.627	16	10 53 14.06	2.0777	10 48 51.7	10.399
17	9 15 22.04	2.0937	17 35 24.8	6.717	17	10 55 18.73	2.0779	10 38 25.8	10.465
18	9 17 27.64	2.0931	17 28 39.1	6.806	18	10 57 23.41	2.0782	10 27 55.9	10.530
19	9 19 33.21	2.0924	17 21 48.1	6.894	19	10 59 28.12	2.0786	10 17 22.2	10.593
20	9 21 38.73	2.0917	17 14 51.8	6.982	20	11 1 32.84	2.0788	10 6 44.8	10.656
21	9 23 44.22	2.0911	17 7 50.3	7.069	21	11 3 37.58	2.0792	9 56 3.5	10.719
22	9 25 49.66	2.0904	17 0 43.5	7.157	22	11 5 42.34	2.0795	9 45 18.5	10.780
23	9 27 55.07	2.0898	N. 16 53 31.4	7.244	23	11 7 47.12	2.0800	N. 9 34 29.9	10.841
MONDAY 22.					WEDNESDAY 24.				
0	9 30 0.44	2.0892	N. 16 46 14.2	7.330	0	11 9 51.94	2.0805	N. 9 23 37.6	10.902
1	9 32 5.77	2.0886	16 38 51.8	7.417	1	11 11 56.78	2.0810	9 12 41.7	10.961
2	9 34 11.07	2.0880	16 31 24.2	7.502	2	11 14 1.66	2.0816	9 1 42.3	11.019
3	9 36 16.33	2.0874	16 23 51.5	7.587	3	11 16 6.57	2.0821	8 50 39.4	11.077
4	9 38 21.56	2.0868	16 16 13.7	7.672	4	11 18 11.51	2.0827	8 39 33.0	11.135
5	9 40 26.75	2.0862	16 8 30.8	7.757	5	11 20 16.49	2.0833	8 28 23.2	11.192
6	9 42 31.90	2.0856	16 0 42.9	7.840	6	11 22 21.51	2.0841	8 17 10.0	11.247
7	9 44 37.02	2.0851	15 52 50.0	7.924	7	11 24 26.58	2.0848	8 5 53.5	11.302
8	9 46 42.11	2.0846	15 44 52.0	8.007	8	11 26 31.69	2.0856	7 54 33.7	11.357
9	9 48 47.17	2.0840	15 36 49.1	8.090	9	11 28 36.85	2.0863	7 43 10.7	11.410
10	9 50 52.19	2.0835	15 28 41.2	8.172	10	11 30 42.05	2.0872	7 31 44.5	11.463
11	9 52 57.19	2.0830	15 20 28.4	8.254	11	11 32 47.31	2.0881	7 20 15.1	11.515
12	9 55 2.15	2.0825	15 12 10.7	8.336	12	11 34 52.62	2.0890	7 8 42.7	11.566
13	9 57 7.09	2.0821	15 3 48.1	8.417	13	11 36 57.99	2.0900	6 57 7.2	11.616
14	9 59 12.00	2.0816	14 55 20.7	8.497	14	11 39 3.42	2.0910	6 45 28.8	11.665
15	10 1 16.88	2.0811	14 46 48.5	8.576	15	11 41 8.91	2.0920	6 33 47.4	11.714
16	10 3 21.73	2.0807	14 38 11.6	8.655	16	11 43 14.46	2.0931	6 22 3.1	11.762
17	10 5 26.57	2.0804	14 29 29.9	8.735	17	11 45 20.08	2.0942	6 10 16.0	11.808
18	10 7 31.38	2.0799	14 20 43.4	8.814	18	11 47 25.77	2.0954	5 58 26.1	11.854
19	10 9 36.16	2.0796	14 11 52.2	8.892	19	11 49 31.53	2.0967	5 46 33.5	11.898
20	10 11 40.93	2.0792	14 2 56.4	8.968	20	11 51 37.37	2.0980	5 34 38.3	11.943
21	10 13 45.67	2.0789	13 53 56.0	9.046	21	11 53 43.29	2.0992	5 22 40.4	11.987
22	10 15 50.40	2.0787	13 44 50.9	9.122	22	11 55 49.28	2.1005	5 10 39.9	12.029
23	10 17 55.11	2.0784	13 35 41.3	9.198	23	11 57 55.35	2.1019	4 58 36.9	12.070
24	10 19 59.81	2.0782	N. 13 26 27.1	9.273	24	12 0 1.51	2.1034	N. 4 46 31.5	12.110

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 25.					SATURDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	12 0 1.51	2.1034	N. 4 46 31.5	12.110	1	13 43 31.77	2.2272	S. 5 21 3.6	12.746
2	12 2 7.76	2.1048	4 34 23.7	12.149	2	13 45 45.51	2.2309	5 33 47.8	12.727
3	12 4 14.09	2.1063	4 22 13.6	12.188	3	13 47 59.48	2.2347	5 46 30.9	12.708
4	12 6 20.52	2.1080	4 10 1.2	12.226	4	13 50 13.68	2.2385	5 59 12.8	12.687
5	12 8 27.05	2.1096	3 57 46.5	12.262	5	13 52 28.10	2.2422	6 11 53.3	12.663
6	12 10 33.67	2.1112	3 45 29.7	12.298	6	13 54 42.75	2.2461	6 24 32.4	12.639
7	12 12 40.40	2.1130	3 33 10.8	12.332	7	13 56 57.63	2.2500	6 37 10.0	12.614
8	12 14 47.23	2.1147	3 20 49.8	12.366	8	13 59 12.75	2.2540	6 49 46.1	12.587
9	12 16 54.17	2.1165	3 8 26.9	12.398	9	14 1 28.11	2.2579	7 2 20.5	12.558
10	12 19 1.21	2.1183	2 56 2.0	12.431	10	14 3 43.70	2.2619	7 14 53.1	12.528
11	12 21 8.37	2.1203	2 43 35.2	12.461	11	14 5 59.54	2.2660	7 27 23.9	12.497
12	12 23 15.65	2.1222	2 31 6.7	12.490	12	14 8 15.62	2.2700	7 39 52.8	12.464
13	12 25 23.04	2.1242	2 18 36.4	12.518	13	14 10 31.94	2.2741	7 52 19.6	12.429
14	12 27 30.55	2.1262	2 6 4.5	12.546	14	14 12 48.51	2.2782	8 4 44.3	12.393
15	12 29 38.19	2.1283	1 53 30.9	12.572	15	14 15 5.33	2.2824	8 17 6.8	12.356
16	12 31 45.95	2.1304	1 40 55.8	12.597	16	14 17 22.40	2.2867	8 29 27.0	12.317
17	12 33 53.84	2.1327	1 28 19.3	12.621	17	14 19 39.73	2.2909	8 41 44.8	12.275
18	12 36 1.87	2.1349	1 15 41.3	12.645	18	14 21 57.31	2.2951	8 54 0.0	12.232
19	12 38 10.03	2.1372	1 3 1.9	12.667	19	14 24 15.14	2.2994	9 6 12.7	12.189
20	12 40 18.33	2.1395	0 50 21.3	12.687	20	14 26 33.24	2.3037	9 18 22.7	12.144
21	12 42 26.77	2.1419	0 37 39.5	12.707	21	14 28 51.59	2.3081	9 30 30.0	12.097
22	12 44 35.36	2.1443	0 24 56.5	12.725	22	14 31 10.21	2.3125	9 42 34.4	12.049
23	12 46 44.09	2.1467	N. 0 12 12.5	12.742	23	14 33 29.09	2.3168	9 54 35.9	11.999
24	12 48 52.97	2.1492	S. 0 0 32.5	12.758	24	14 35 48.23	2.3212	S. 10 6 34.3	11.947
FRIDAY 26.					SUNDAY 28.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	12 51 2.00	2.1518	S. 0 13 18.5	12.773	1	14 38 7.64	2.3257	S. 10 18 29.5	11.893
2	12 53 11.19	2.1544	0 26 5.3	12.787	2	14 40 27.32	2.3302	10 30 21.5	11.839
3	12 55 20.53	2.1570	0 38 52.9	12.799	3	14 42 47.26	2.3346	10 42 10.2	11.782
4	12 57 30.03	2.1597	0 51 41.2	12.810	4	14 45 7.47	2.3392	10 53 55.4	11.724
5	12 59 39.70	2.1626	1 4 30.1	12.820	5	14 47 27.96	2.3437	11 5 37.1	11.665
6	13 1 49.54	2.1654	1 17 19.6	12.829	6	14 49 48.71	2.3482	11 17 15.2	11.603
7	13 3 59.55	2.1682	1 30 9.6	12.837	7	14 52 9.74	2.3527	11 28 49.5	11.540
8	13 6 9.72	2.1710	1 43 0.0	12.842	8	14 54 31.04	2.3572	11 40 20.0	11.476
9	13 8 20.07	2.1741	1 55 50.7	12.847	9	14 56 52.61	2.3618	11 51 46.6	11.410
10	13 10 30.61	2.1771	2 8 41.7	12.852	10	14 59 14.46	2.3665	12 3 9.2	11.342
11	13 12 41.32	2.1800	2 21 32.9	12.854	11	15 1 36.59	2.3711	12 14 27.7	11.273
12	13 14 52.21	2.1831	2 34 24.2	12.855	12	15 3 58.99	2.3756	12 25 42.0	11.202
13	13 17 3.29	2.1862	2 47 15.5	12.855	13	15 6 21.66	2.3802	12 36 52.0	11.130
14	13 19 14.56	2.1894	3 0 6.8	12.853	14	15 8 44.61	2.3848	12 47 57.6	11.056
15	13 21 26.02	2.1927	3 12 57.9	12.849	15	15 11 7.84	2.3894	12 58 58.7	10.981
16	13 23 37.68	2.1959	3 25 48.7	12.845	16	15 13 31.34	2.3940	13 9 55.3	10.904
17	13 25 49.53	2.1992	3 38 39.3	12.840	17	15 15 55.12	2.3986	13 20 47.2	10.825
18	13 28 1.59	2.2026	3 51 29.5	12.833	18	15 18 19.17	2.4032	13 31 34.3	10.744
19	13 30 13.84	2.2059	4 4 19.3	12.825	19	15 20 43.50	2.4077	13 42 16.5	10.662
20	13 32 26.30	2.2094	4 17 8.5	12.815	20	15 23 8.10	2.4124	13 52 53.8	10.579
21	13 34 38.97	2.2129	4 29 57.1	12.804	21	15 25 32.99	2.4170	14 3 26.0	10.493
22	13 36 51.85	2.2164	4 42 45.0	12.792	22	15 27 58.14	2.4215	14 13 53.0	10.407
23	13 39 4.94	2.2200	4 55 32.1	12.777	23	15 30 23.57	2.4261	14 24 14.8	10.319
24	13 41 18.25	2.2236	5 8 18.3	12.762	24	15 32 49.27	2.4307	14 34 31.3	10.230
		2.2272	S. 5 21 3.6	12.746			2.4352	S. 14 44 42.4	10.139

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 29.					WEDNESDAY, MAY 1.				
0	h m s		° ' "	"	0	h m s		° ' "	"
1	15 35 15.25	2.4352	S. 14 44 42.4	10.139	1	17 36 36.88	2.5971	S. 20 40 0.2	4.218
2	15 37 41.50	2.4397	14 54 48.0	10.046	PHASES OF THE MOON.				
3	15 40 8.02	2.4442	15 4 47.9	9.951					
4	15 42 34.81	2.4487	15 14 42.1	9.855					
5	15 45 1.87	2.4532	15 24 30.5	9.758					
6	15 47 29.19	2.4575	15 34 13.1	9.660					
7	15 49 56.77	2.4619	15 43 49.7	9.559					
8	15 52 24.62	2.4664	15 53 20.2	9.457					
9	15 54 52.74	2.4707	16 2 44.6	9.354					
10	15 57 21.11	2.4750	16 12 2.7	9.249					
11	15 59 49.74	2.4792	16 21 14.5	9.143					
12	16 2 18.62	2.4835	16 30 19.9	9.036					
13	16 4 47.76	2.4877	16 39 18.8	8.927					
14	16 7 17.15	2.4919	16 48 11.1	8.817					
15	16 9 46.79	2.4961	16 56 56.8	8.705					
16	16 12 16.68	2.5002	17 5 35.7	8.592					
17	16 14 46.81	2.5042	17 14 7.8	8.477					
18	16 17 17.18	2.5082	17 22 32.9	8.361					
19	16 19 47.79	2.5121	17 30 51.1	8.244					
20	16 22 18.63	2.5159	17 39 2.2	8.126					
21	16 24 49.70	2.5197	17 47 6.2	8.007					
22	16 27 21.00	2.5235	17 55 3.0	7.885					
23	16 29 52.52	2.5272	18 2 52.4	7.762					
24	16 32 24.27	2.5309	S. 18 10 34.5	7.640					
TUESDAY 30.					☾ Last Quarter . . . Apr. 5 3 20.5				
0	16 34 56.23	2.5345	S. 18 18 9.2	7.515	● New Moon . . . . . 12 7 5.8				
1	16 37 28.41	2.5380	18 25 36.3	7.388	☾ First Quarter . . . . . 20 8 38.0				
2	16 40 0.79	2.5414	18 32 55.8	7.262	○ Full Moon . . . . . 27 18 4.8				
3	16 42 33.38	2.5448	18 40 7.7	7.134					
4	16 45 6.17	2.5482	18 47 11.9	7.004					
5	16 47 39.16	2.5514	18 54 8.2	6.873	☾ Perigee . . . . . Apr. 2 16.6				
6	16 50 12.34	2.5546	19 0 56.7	6.742	☾ Apogee . . . . . 18 5.3				
7	16 52 45.71	2.5577	19 7 37.3	6.610	☾ Perigee . . . . . 30 1.5				
8	16 55 19.27	2.5607	19 14 9.9	6.477					
9	16 57 53.00	2.5636	19 20 34.5	6.342					
10	17 0 26.90	2.5664	19 26 50.9	6.206					
11	17 3 0.97	2.5692	19 32 59.2	6.070					
12	17 5 35.21	2.5720	19 38 59.3	5.932					
13	17 8 9.61	2.5746	19 44 51.1	5.794					
14	17 10 44.16	2.5771	19 50 34.6	5.654					
15	17 13 18.86	2.5795	19 56 9.6	5.513					
16	17 15 53.70	2.5819	20 1 36.2	5.373					
17	17 18 28.68	2.5841	20 6 54.4	5.232					
18	17 21 3.79	2.5862	20 12 4.1	5.090					
19	17 23 39.02	2.5882	20 17 5.2	4.946					
20	17 26 14.38	2.5902	20 21 57.6	4.801					
21	17 28 49.85	2.5920	20 26 41.3	4.657					
22	17 31 25.42	2.5937	20 31 16.4	4.512					
23	17 34 1.10	2.5955	20 35 42.7	4.365					
24	17 36 36.88	2.5971	S. 20 40 0.2	4.218					

	d	h	m
☾ Last Quarter . . . . .	Apr.	5	3 20.5
● New Moon . . . . .		12	7 5.8
☾ First Quarter . . . . .		20	8 38.0
○ Full Moon . . . . .		27	18 4.8

	d	h
☾ Perigee . . . . .	Apr.	2 16.6
☾ Apogee . . . . .		18 5.3
☾ Perigee . . . . .		30 1.5

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
1	Regulus W.	77 9 18	2265	78 56 9	2262	80 43 4	2259	82 30 4	2257
	Spica W.	24 7 23	2453	25 49 42	2429	27 32 36	2407	29 16 1	2388
	MARS E.	44 24 5	2421	42 41 0	2418	40 57 51	2416	39 14 38	2414
	Fomalhaut E.	107 27 17	2510	105 46 17	2502	104 5 7	2496	102 23 48	2490
2	Regulus W.	91 25 45	2250	93 12 58	2249	95 0 12	2249	96 47 26	2249
	Spica W.	37 58 28	2332	39 43 41	2326	41 29 3	2320	43 14 33	2315
	MARS E.	30 38 12	2412	28 54 55	2414	27 11 40	2416	25 28 27	2419
	Fomalhaut E.	93 55 35	2474	92 13 45	2473	90 31 54	2472	88 50 2	2472
	SATURN E.	110 39 42	2286	108 53 22	2286	107 7 2	2286	105 20 42	2285
	SUN E.	131 26 37	2585	129 47 21	2583	128 8 2	2581	126 28 41	2580
3	Regulus W.	105 43 25	2254	107 30 32	2256	109 17 36	2258	111 4 37	2260
	Spica W.	52 3 21	2303	53 49 15	2303	55 35 10	2303	57 21 5	2303
	Fomalhaut E.	80 21 9	2485	78 39 35	2490	76 58 8	2495	75 16 48	2501
	SATURN E.	96 29 8	2290	94 42 54	2292	92 56 43	2294	91 10 34	2296
	SUN E.	118 11 52	2583	116 32 33	2584	114 53 15	2585	113 13 59	2587
4	Spica W.	66 10 24	2310	67 56 9	2312	69 41 51	2315	71 27 29	2317
	Fomalhaut E.	66 52 36	2544	65 12 24	2555	63 32 26	2567	61 52 46	2580
	SATURN E.	82 20 44	2310	80 34 58	2313	78 49 17	2316	77 3 41	2320
	SUN E.	104 58 26	2600	103 19 31	2603	101 40 40	2607	100 1 54	2610
5	Spica W.	80 14 32	2335	81 59 41	2338	83 44 45	2342	85 29 43	2347
	Antares W.	34 45 22	2443	36 27 55	2437	38 10 37	2431	39 53 27	2427
	Fomalhaut E.	53 39 30	2666	52 2 5	2689	50 25 11	2713	48 48 49	2740
	SATURN E.	68 17 5	2340	66 32 3	2345	64 47 8	2349	63 2 20	2353
	SUN E.	91 49 23	2630	90 11 10	2635	88 33 3	2640	86 55 3	2645
6	Spica W.	94 12 52	2371	95 57 9	2376	97 41 18	2381	99 25 20	2387
	Antares W.	48 28 36	2421	50 11 41	2422	51 54 44	2423	53 37 46	2424
	MARS W.	24 31 46	2507	26 12 50	2510	27 53 50	2513	29 34 46	2516
	SATURN E.	54 19 59	2378	52 35 52	2383	50 51 53	2389	49 8 2	2394
	SUN E.	78 46 44	2672	77 9 26	2677	75 32 15	2683	73 55 12	2689
7	Spica W.	108 3 24	2417	109 46 35	2424	111 29 36	2430	113 12 28	2437
	Antares W.	62 12 5	2440	63 54 43	2444	65 37 15	2448	67 19 42	2453
	MARS W.	37 58 6	2538	39 38 28	2543	41 18 42	2548	42 58 49	2553
	SATURN E.	40 30 48	2423	38 47 46	2430	37 4 54	2436	35 22 10	2443
	SUN E.	65 51 59	2720	64 15 45	2727	62 39 41	2734	61 3 46	2741
8	Antares W.	75 50 14	2478	77 31 58	2484	79 13 33	2490	80 55 1	2496
	MARS W.	51 17 31	2582	52 56 51	2588	54 36 3	2594	56 15 6	2601
	SATURN E.	26 51 0	2480	25 9 18	2488	23 27 48	2497	21 46 30	2507
	SUN E.	53 6 32	2778	51 31 35	2786	49 56 49	2795	48 22 14	2803
9	Antares W.	89 20 5	2530	91 0 37	2538	92 40 58	2545	94 21 9	2553
	MARS W.	64 28 5	2635	66 6 12	2642	67 44 9	2649	69 21 57	2657
	SUN E.	40 32 13	2851	38 58 51	2862	37 25 43	2873	35 52 49	2885
14	SUN W.	20 31 17	3341	21 54 41	3339	23 18 7	3338	24 41 34	3339
	JUPITER E.	51 15 5	2909	49 42 58	2920	48 11 4	2930	46 39 23	2940

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Regulus W.	84 17 7	2255	86 4 13	2253	87 51 22	2252	89 38 33	2251
	Spica W.	30 59 53	2373	32 44 7	2360	34 28 39	2349	36 13 27	2340
	MARS E.	37 31 23	2412	35 48 6	2412	34 4 48	2412	32 21 30	2412
	Fomalhaut E.	100 42 21	2485	99 0 47	2481	97 19 7	2478	95 37 22	2476
2	Regulus W.	98 34 40	2250	100 21 53	2251	102 9 5	2252	103 56 16	2253
	Spica W.	45 0 10	2312	46 45 52	2309	48 31 38	2307	50 17 28	2305
	MARS E.	23 45 19	2423	22 2 17	2429	20 19 23	2435	18 36 38	2442
	Fomalhaut E.	87 8 10	2474	85 26 20	2476	83 44 33	2478	82 2 49	2481
	SATURN E.	103 34 21	2286	101 48 1	2287	100 1 42	2288	98 15 24	2289
	SUN E.	124 49 19	2580	123 9 57	2580	121 30 35	2580	119 51 13	2581
3	Regulus W.	112 51 35	2263	114 38 29	2266	116 25 19	2268	118 12 5	2271
	Spica W.	59 7 0	2304	60 52 54	2305	62 38 46	2307	64 24 36	2308
	Fomalhaut E.	73 35 36	2508	71 54 34	2515	70 13 42	2524	68 33 2	2534
	SATURN E.	89 24 29	2298	87 38 27	2301	85 52 20	2304	84 6 34	2307
	SUN E.	111 34 46	2589	109 55 36	2591	108 16 29	2594	106 37 26	2597
4	Spica W.	73 13 3	2320	74 58 33	2324	76 43 57	2327	78 29 17	2331
	Fomalhaut E.	60 13 24	2594	58 34 21	2610	56 55 40	2627	55 17 22	2646
	SATURN E.	75 18 11	2324	73 32 46	2328	71 47 27	2331	70 2 13	2335
	SUN E.	98 23 13	2614	96 44 37	2618	95 6 7	2622	93 27 42	2626
5	Spica W.	87 14 34	2352	88 59 18	2356	90 43 56	2361	92 28 27	2366
	Antares W.	41 36 23	2424	43 19 23	2422	45 2 26	2421	46 45 31	2421
	Fomalhaut E.	47 13 2	2770	45 37 55	2803	44 3 31	2839	42 29 53	2879
	SATURN E.	61 17 38	2358	59 33 3	2363	57 48 35	2368	56 4 13	2373
	SUN E.	85 17 9	2650	83 39 22	2655	82 1 43	2660	80 24 10	2666
6	Spica W.	101 9 13	2393	102 52 58	2398	104 36 35	2404	106 20 4	2410
	Antares W.	55 20 46	2427	57 3 42	2430	58 46 34	2433	60 29 22	2436
	MARS W.	31 15 37	2520	32 56 23	2524	34 37 3	2528	36 17 38	2533
	SATURN E.	47 24 19	2400	45 40 44	2405	43 57 17	2411	42 13 58	2417
	SUN E.	72 18 17	2695	70 41 30	2701	69 4 52	2707	67 28 21	2713
7	Spica W.	114 55 10	2444	116 37 42	2451	118 20 4	2459	120 2 15	2466
	Antares W.	69 2 2	2457	70 44 16	2462	72 26 22	2467	74 8 22	2472
	MARS W.	44 38 49	2559	46 18 41	2564	47 58 26	2570	49 38 3	2576
	SATURN E.	33 39 36	2449	31 57 11	2457	30 14 57	2464	28 32 53	2472
	SUN E.	59 28 0	2747	57 52 23	2755	56 16 56	2763	54 41 39	2770
8	Antares W.	82 36 20	2502	84 17 30	2509	85 58 31	2515	87 39 23	2522
	MARS W.	57 54 0	2607	59 32 45	2614	61 11 21	2621	62 49 48	2628
	SATURN E.	20 5 26	2518	18 24 37	2530	16 44 5	2544	15 3 53	2561
	SUN E.	46 47 50	2812	45 13 38	2821	43 39 37	2831	42 5 49	2841
9	Antares W.	96 1 9	2561	97 40 58	2569	99 20 36	2577	101 0 3	2585
	MARS W.	70 59 34	2665	72 37 1	2673	74 14 17	2681	75 51 22	2689
	SUN E.	34 20 11	2897	32 47 48	2910	31 15 42	2924	29 43 54	2939
14	SUN W.	26 5 0	3340	27 28 25	3342	28 51 47	3346	30 15 5	3351
	JUPITER E.	45 7 54	2950	43 36 39	2960	42 5 36	2970	40 34 46	2980

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
14	Pollux E.	69 24 25	2897	67 52 2	2908	66 19 53	2918	64 47 57	2929
	Regulus E.	105 9 58	2859	103 36 47	2870	102 3 50	2880	100 31 5	2890
15	SUN W.	31 38 18	3357	33 1 24	3362	34 24 24	3367	35 47 18	3373
	JUPITER E.	39 4 9	2990	37 33 44	3000	36 3 31	3009	34 33 30	3018
	Pollux E.	57 11 43	2983	55 41 9	2994	54 10 49	3005	52 40 42	3015
	Regulus E.	92 50 25	2936	91 18 52	2946	89 47 31	2954	88 16 21	2962
16	SUN W.	42 40 3	3404	44 2 15	3410	45 24 20	3415	46 46 19	3421
	JUPITER E.	27 6 14	3064	25 37 20	3073	24 8 37	3082	22 40 5	3091
	Pollux E.	45 13 24	3069	43 44 36	3080	42 16 2	3091	40 47 42	3102
	Regulus E.	80 43 4	3002	79 12 54	3009	77 42 52	3015	76 12 58	3022
17	SUN W.	53 34 44	3445	54 56 9	3449	56 17 30	3453	57 38 47	3456
	Regulus E.	68 45 23	3050	67 16 12	3054	65 47 6	3058	64 18 5	3062
	Spica E.	122 29 50	3091	121 1 30	3095	119 33 15	3098	118 5 3	3101
18	SUN W.	64 24 25	3466	65 45 26	3467	67 6 27	3468	68 27 27	3467
	Aldebaran W.	23 22 37	3082	24 51 9	3081	26 19 42	3080	27 48 16	3080
	Regulus E.	56 53 59	3074	55 25 18	3076	53 56 39	3077	52 28 1	3077
	Spica E.	110 44 39	3108	109 16 39	3108	107 48 39	3108	106 20 39	3108
19	SUN W.	75 12 43	3460	76 33 52	3457	77 55 5	3453	79 16 21	3449
	Aldebaran W.	35 11 22	3072	36 40 6	3069	38 8 54	3065	39 37 46	3061
	Regulus E.	45 4 47	3073	43 36 4	3071	42 7 19	3068	40 38 30	3065
	Spica E.	99 0 27	3100	97 32 17	3098	96 4 5	3095	94 35 49	3091
20	SUN W.	86 4 2	3422	87 25 54	3415	88 47 54	3407	90 10 3	3400
	Aldebaran W.	47 3 25	3036	48 32 53	3029	50 2 29	3022	51 32 14	3015
	JUPITER W.	20 2 59	3109	21 30 58	3100	22 59 7	3091	24 27 27	3082
	Regulus E.	33 13 18	3043	31 43 59	3038	30 14 33	3032	28 45 0	3026
	Spica E.	87 13 10	3066	85 44 19	3060	84 15 21	3053	82 46 14	3046
21	SUN W.	97 3 11	3332	98 26 22	3341	99 49 46	3330	101 13 23	3319
	Aldebaran W.	59 3 27	2971	60 34 16	2961	62 5 17	2950	63 36 32	2940
	JUPITER W.	31 52 5	3033	33 21 37	3022	34 51 23	3010	36 21 23	2999
	Spica E.	75 18 19	3005	73 48 12	2995	72 17 53	2985	70 47 22	2975
	Antares E.	121 8 48	3032	119 39 15	3020	118 9 27	3008	116 39 24	2995
22	SUN W.	108 15 0	3253	109 40 6	3240	111 5 28	3225	112 31 7	3210
	Aldebaran W.	71 16 22	2879	72 49 8	2866	74 22 10	2852	75 55 30	2838
	JUPITER W.	43 55 7	2936	45 26 40	2923	46 58 30	2909	48 30 38	2894
	Pollux W.	27 52 0	3029	29 21 37	3022	30 51 47	2977	32 22 29	2953
	Spica E.	63 11 27	2920	61 39 33	2908	60 7 24	2895	58 34 59	2883
	Antares E.	109 5 8	2929	107 33 26	2915	106 1 26	2900	104 29 7	2886
23	SUN W.	119 43 54	3133	121 11 24	3117	122 39 13	3101	124 7 22	3083
	Aldebaran W.	83 46 49	2764	85 22 4	2749	86 57 39	2733	88 33 35	2717
	JUPITER W.	56 16 0	2819	57 50 3	2803	59 24 27	2787	60 59 12	2771
	Pollux W.	40 3 17	2843	41 36 49	2822	43 10 48	2802	44 45 13	2782
	Spica E.	50 48 53	2819	49 14 50	2806	47 40 30	2794	46 5 54	2782
	Antares E.	96 42 48	2809	95 8 32	2794	93 33 56	2778	91 58 59	2762



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
14	Pollux	E.	63 16 15	2940	61 44 47	2951	60 13 32	2962	58 42 31	2972
	Regulus	E.	98 58 33	2899	97 26 13	2909	95 54 5	2918	94 22 9	2927
15	SUN	W.	37 10 6	3379	38 32 46	3386	39 55 18	3392	41 17 44	3398
	JUPITER	E.	33 3 40	3028	31 34 2	3037	30 4 35	3046	28 35 19	3055
	Pollux	E.	51 10 48	3026	49 41 7	3037	48 11 40	3047	46 42 25	3058
	Regulus	E.	86 45 21	2971	85 14 32	2979	83 43 53	2987	82 13 24	2994
16	SUN	W.	48 8 12	3426	49 29 58	3431	50 51 39	3436	52 13 14	3441
	JUPITER	E.	21 11 43	3100	19 43 33	3109	18 15 34	3119	16 47 48	3131
	Pollux	E.	39 19 35	3114	37 51 42	3126	36 24 4	3138	34 56 40	3151
	Regulus	E.	74 43 12	3028	73 13 34	3034	71 44 4	3039	70 14 40	3045
17	SUN	W.	59 0 0	3459	60 21 10	3461	61 42 17	3463	63 3 22	3465
	Regulus	E.	62 49 9	3065	61 20 17	3068	59 51 28	3070	58 22 42	3072
	Spica	E.	116 36 54	3102	115 8 47	3104	113 40 43	3105	112 12 40	3107
18	SUN	W.	69 48 28	3466	71 9 29	3465	72 30 32	3464	73 51 36	3462
	Aldebaran	W.	29 16 50	3079	30 45 25	3078	32 14 2	3076	33 42 41	3074
	Regulus	E.	50 59 23	3077	49 30 45	3077	48 2 7	3076	46 33 28	3074
	Spica	E.	104 52 39	3107	103 24 38	3106	101 56 37	3105	100 28 33	3103
19	SUN	W.	80 37 42	3445	81 59 8	3440	83 20 39	3434	84 42 17	3428
	Aldebaran	W.	41 6 42	3057	42 35 44	3052	44 4 51	3047	45 34 5	3042
	Regulus	E.	39 9 37	3061	37 40 40	3057	36 11 38	3053	34 42 31	3048
	Spica	E.	93 7 28	3087	91 39 2	3082	90 10 31	3077	88 41 54	3072
20	SUN	W.	91 32 20	3391	92 54 47	3382	94 17 24	3372	95 40 12	3362
	Aldebaran	W.	53 2 8	3008	54 32 11	2999	56 2 25	2990	57 32 50	2981
	JUPITER	W.	25 55 59	3073	27 24 42	3063	28 53 37	3053	30 22 45	3043
	Regulus	E.	27 15 19	3080	25 45 31	3014	24 15 35	3007	22 45 31	2999
	Spica	E.	81 16 58	3039	79 47 33	3031	78 17 59	3022	76 48 14	3014
21	SUN	W.	102 37 13	3306	104 1 17	3294	105 25 36	3281	106 50 10	3267
	Aldebaran	W.	65 8 0	2928	66 39 43	2917	68 11 40	2905	69 43 53	2892
	JUPITER	W.	37 51 37	2987	39 22 6	2975	40 52 50	2962	42 23 50	2949
	Spica	E.	69 16 38	2965	67 45 41	2954	66 14 31	2942	64 43 6	2931
	Antares	E.	115 9 5	2983	113 38 31	2970	112 7 40	2956	110 36 33	2942
22	SUN	W.	113 57 4	3195	115 23 19	3180	116 49 52	3164	118 16 44	3149
	Aldebaran	W.	77 29 8	2824	79 3 5	2810	80 37 20	2795	82 11 55	2780
	JUPITER	W.	50 3 5	2880	51 35 50	2865	53 8 53	2850	54 42 16	2834
	Pollux	W.	33 53 41	2929	35 25 23	2907	36 57 33	2885	38 30 11	2863
	Spica	E.	57 2 18	2870	55 29 21	2858	53 56 8	2845	52 22 39	2832
	Antares	E.	102 56 30	2871	101 23 34	2856	99 50 19	2841	98 16 44	2825
23	SUN	W.	125 35 52	3067	127 4 42	3051	128 33 52	3034	130 3 23	3016
	Aldebaran	W.	90 9 53	2701	91 46 32	2685	93 23 32	2668	95 0 55	2652
	JUPITER	W.	62 34 18	2754	64 9 46	2738	65 45 36	2721	67 21 48	2704
	Pollux	W.	46 20 5	2762	47 55 23	2743	49 31 5	2724	51 7 13	2704
	Spica	E.	44 31 2	2769	42 55 54	2757	41 20 30	2745	39 44 50	2733
	Antares	E.	90 23 41	2745	88 48 1	2729	87 12 0	2713	85 35 37	2696

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
24	Aldebaran W.	96 38 40	2635	98 16 48	2618	99 55 19	2601	101 34 13	2584
	JUPITER W.	68 58 22	2688	70 35 18	2670	72 12 38	2653	73 50 21	2636
	Pollux W.	52 43 48	2685	54 20 48	2666	55 58 13	2648	57 36 3	2629
	Regulus W.	16 35 1	2666	18 12 27	2645	19 50 21	2624	21 28 44	2603
	Spica E.	38 8 54	2723	36 32 45	2715	34 56 25	2707	33 19 53	2699
	Antares E.	83 58 52	2680	82 21 45	2663	80 44 15	2647	79 6 24	2630
	MARS E.	115 3 52	2766	113 28 40	2749	111 53 5	2731	110 17 6	2713
25	Aldebaran W.	109 54 30	2499	111 35 44	2483	113 17 20	2467	114 59 20	2450
	JUPITER W.	82 4 44	2551	83 44 47	2534	85 25 13	2517	87 6 2	2501
	Pollux W.	65 51 33	2538	67 31 54	2520	69 12 39	2502	70 53 49	2485
	Regulus W.	29 47 22	2510	31 28 22	2492	33 9 47	2475	34 51 36	2457
	Antares E.	70 51 34	2550	69 11 30	2535	67 31 5	2520	65 50 19	2504
	MARS E.	102 11 13	2624	100 32 51	2607	98 54 6	2590	97 14 57	2572
	$\alpha$ Aquilæ E.	115 20 29	3248	113 55 17	3213	112 29 23	3179	111 2 49	3147
26	JUPITER W.	95 35 50	2421	97 18 55	2406	99 2 21	2391	100 46 8	2377
	Pollux W.	79 25 32	2404	81 9 1	2388	82 52 53	2373	84 37 7	2359
	Regulus W.	43 26 42	2375	45 10 52	2360	46 55 24	2345	48 40 18	2330
	Antares E.	57 21 23	2436	55 38 39	2423	53 55 37	2412	52 12 19	2401
	MARS E.	88 53 22	2490	87 11 55	2475	85 30 6	2459	83 47 55	2444
	$\alpha$ Aquilæ E.	103 40 45	3007	102 10 41	2985	100 40 9	2963	99 9 9	2942
27	JUPITER W.	109 30 8	2310	111 15 53	2298	113 1 56	2286	114 48 16	2275
	Pollux W.	93 23 18	2292	95 9 30	2280	96 55 59	2269	98 42 45	2258
	Regulus W.	57 30 1	2263	59 16 55	2250	61 4 8	2239	62 51 38	2227
	Antares E.	43 32 17	2360	41 47 44	2355	40 3 4	2351	38 18 19	2350
	MARS E.	75 11 52	2375	73 27 41	2362	71 43 12	2350	69 58 26	2339
	$\alpha$ Aquilæ E.	91 28 14	2861	89 55 5	2849	88 21 40	2838	86 48 2	2829
28	Pollux W.	107 40 17	2212	109 28 26	2205	111 16 46	2198	113 5 16	2192
	Regulus W.	71 53 6	2178	73 42 6	2170	75 31 18	2163	77 20 41	2156
	MARS E.	61 10 37	2289	59 24 21	2281	57 37 53	2273	55 51 13	2266
	$\alpha$ Aquilæ E.	78 57 38	2808	77 23 21	2810	75 49 6	2813	74 14 55	2818
	Fomalhaut E.	112 24 6	2433	110 41 18	2419	108 58 11	2407	107 14 46	2395
29	Regulus W.	86 29 58	2130	88 20 11	2127	90 10 30	2124	92 0 53	2122
	Spica W.	33 7 38	2233	34 55 16	2222	36 43 11	2211	38 31 22	2201
	MARS E.	46 55 37	2240	45 8 8	2237	43 20 35	2234	41 32 58	2231
	$\alpha$ Aquilæ E.	66 26 37	2878	64 53 49	2898	63 21 27	2920	61 49 34	2946
	Fomalhaut E.	98 33 56	2353	96 49 13	2348	95 4 22	2343	93 19 25	2339
	$\alpha$ Pegasi E.	113 46 18	2577	112 6 52	2564	110 27 7	2561	108 47 4	2540
	SATURN E.	118 33 2	2161	116 43 36	2157	114 54 4	2154	113 4 27	2151
30	Regulus W.	101 13 22	2119	103 3 52	2120	104 54 21	2122	106 44 48	2124
	Spica W.	47 35 9	2174	49 24 15	2173	51 13 23	2172	53 2 33	2171
	MARS E.	32 34 25	2233	30 46 45	2235	28 59 9	2238	27 11 38	2242
	$\alpha$ Aquilæ E.	54 19 48	3136	52 52 22	3188	51 25 59	3247	50 0 45	3313
	Fomalhaut E.	84 33 59	2339	82 48 56	2342	81 3 58	2346	79 19 5	2351
	$\alpha$ Pegasi E.	100 23 32	2504	98 42 25	2502	97 1 14	2501	95 20 1	2500
	SATURN E.	103 55 44	2148	102 5 58	2149	100 16 14	2151	98 26 32	2153

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
24	Aldebaran W.	103 13 30	2567	104 53 10	2550	106 33 13	2533	108 13 40	2516
	JUPITER W.	75 28 27	2619	77 6 56	2602	78 45 49	2585	80 25 5	2568
	Pollux W.	59 14 19	2610	60 53 0	2592	62 32 6	2574	64 11 37	2556
	Regulus W.	23 7 35	2583	24 46 53	2564	26 26 37	2545	28 6 47	2527
	Spica E.	31 43 11	2693	30 6 22	2689	28 29 28	2689	26 52 33	2691
	Antares E.	77 28 10	2614	75 49 34	2598	74 10 36	2582	72 31 16	2566
	MARS E.	108 40 43	2695	107 3 56	2678	105 26 46	2659	103 49 11	2642
25	Aldebaran W.	116 41 43	2434	118 24 29	2419	120 7 37	2403	121 51 8	2387
	JUPITER W.	88 47 14	2485	90 28 49	2469	92 10 47	2453	93 53 7	2437
	Pollux W.	72 35 23	2468	74 17 21	2452	75 59 41	2436	77 42 25	2419
	Regulus W.	36 33 50	2440	38 16 28	2424	39 59 29	2407	41 42 54	2391
	Antares E.	64 9 12	2489	62 27 44	2475	60 45 56	2462	59 3 49	2449
	MARS E.	95 35 24	2556	93 55 28	2539	92 15 9	2522	90 34 27	2506
	α Aquilæ E.	109 35 36	3116	108 7 45	3087	106 39 19	3059	105 10 18	3032
26	JUPITER W.	102 30 16	2363	104 14 44	2348	105 59 33	2335	107 44 41	2322
	Pollux W.	86 21 41	2345	88 6 36	2331	89 51 50	2317	91 37 25	2304
	Regulus W.	50 25 34	2316	52 11 11	2302	53 57 8	2288	55 43 25	2275
	Antares E.	50 28 46	2391	48 44 58	2381	47 0 55	2373	45 16 41	2366
	MARS E.	82 5 23	2429	80 22 30	2415	78 39 17	2401	76 55 44	2388
	α Aquilæ E.	97 37 43	2983	96 5 53	2965	94 33 40	2889	93 1 6	2874
27	JUPITER W.	116 34 52	2265	118 21 43	2255	120 8 50	2245	121 56 11	2235
	Pollux W.	100 29 47	2248	102 17 4	2238	104 4 35	2229	105 52 20	2220
	Regulus W.	64 39 25	2216	66 27 28	2206	68 15 46	2196	70 4 19	2187
	Antares E.	36 33 32	2350	34 48 45	2334	33 4 3	2360	31 19 30	2367
	MARS E.	68 13 23	2328	66 28 4	2317	64 42 29	2307	62 56 40	2298
	α Aquilæ E.	85 14 12	2822	83 40 13	2816	82 6 6	2812	80 31 54	2809
28	Pollux W.	114 53 55	2187	116 42 42	2183	118 31 35	2180	120 20 33	2176
	Regulus W.	79 10 15	2150	80 59 59	2144	82 49 51	2139	84 39 51	2134
	MARS E.	54 4 23	2260	52 17 24	2254	50 30 16	2248	48 43 0	2243
	α Aquilæ E.	72 40 51	2825	71 6 56	2835	69 33 13	2847	67 59 46	2861
	Fomalhaut E.	105 31 3	2384	103 47 5	2375	102 2 54	2366	100 18 30	2359
29	Regulus W.	93 51 19	2120	95 41 48	2119	97 32 19	2118	99 22 51	2118
	Spica W.	40 19 48	2193	42 8 26	2187	43 57 13	2182	45 46 8	2178
	MARS E.	39 45 17	2230	37 57 34	2230	36 9 51	2232	34 22 7	2231
	α Aquilæ E.	60 18 13	2976	58 47 30	2909	57 17 28	2946	55 48 12	2988
	Fomalhaut E.	91 34 23	2337	89 49 18	2337	88 4 12	2336	86 19 5	2337
	α Pegasi E.	107 6 46	2529	105 26 13	2520	103 45 28	2514	102 4 34	2508
	SATURN E.	111 14 45	2149	109 25 1	2149	107 35 16	2148	105 45 30	2148
30	Regulus W.	108 35 11	2126	110 25 30	2130	112 15 44	2134	114 5 52	2137
	Spica W.	54 51 44	2172	56 40 54	2173	58 30 3	2175	60 19 10	2177
	MARS E.	25 24 12	2247	23 36 54	2253	21 49 45	2261	20 2 47	2270
	α Aquilæ E.	48 36 48	3386	47 14 15	3467	45 53 14	3558	44 33 54	3662
	Fomalhaut E.	77 34 19	2357	75 49 42	2363	74 5 14	2371	72 20 58	2380
	α Pegasi E.	93 38 48	2501	91 57 36	2504	90 16 28	2507	88 35 24	2512
	SATURN E.	96 36 53	2156	94 47 18	2159	92 57 48	2162	91 8 23	2166

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.				
Wed.	1	<sup>h</sup> 2 <sup>m</sup> 30 <sup>s</sup> 10.86	<sup>s</sup> 9.520	<sup>°</sup> N.14 <sup>'</sup> 48 <sup>"</sup> 25.4	<sup>"</sup> + 45.90	<sup>'</sup> 15 <sup>"</sup> 54.08	<sup>s</sup> 65.96	<sup>m</sup> 2 <sup>s</sup> 52.19	<sup>s</sup> 0.335	
Thur.	2	2 33 59.61	9.544	15 6 39.6	45.28	15 53.84	66.04	2 59.97	0.312	
Frid.	3	2 37 48.93	9.568	15 24 39.0	44.65	15 53.59	66.12	3 7.19	0.289	
Sat.	4	2 41 38.81	9.592	15 42 23.3	+ 44.01	15 53.35	66.20	3 13.84	0.265	
SUN.	5	2 45 29.27	9.616	15 59 52.2	43.36	15 53.11	66.28	3 19.92	0.241	
Mon.	6	2 49 20.30	9.640	16 17 5.2	42.70	15 52.88	66.36	3 25.42	0.217	
Tues.	7	2 53 11.92	9.664	16 34 2.1	+ 42.02	15 52.65	66.44	3 30.35	0.193	
Wed.	8	2 57 4.12	9.688	16 50 42.6	41.34	15 52.43	66.52	3 34.69	0.169	
Thur.	9	3 0 56.90	9.712	17 7 6.4	40.64	15 52.21	66.60	3 38.45	0.145	
Frid.	10	3 4 50.27	9.736	17 23 13.3	+ 39.92	15 51.99	66.68	3 41.63	0.120	
Sat.	11	3 8 44.22	9.760	17 39 2.7	39.19	15 51.77	66.76	3 44.24	0.097	
SUN.	12	3 12 38.74	9.784	17 54 34.4	38.45	15 51.56	66.85	3 46.27	0.073	
Mon.	13	3 16 33.84	9.808	18 9 48.2	+ 37.69	15 51.35	66.93	3 47.72	0.049	
Tues.	14	3 20 29.52	9.832	18 24 43.7	36.92	15 51.14	67.01	3 48.59	0.025	
Wed.	15	3 24 25.76	9.855	18 39 20.5	36.14	15 50.94	67.09	3 48.90	0.001	
Thur.	16	3 28 22.57	9.878	18 53 38.6	+ 35.36	15 50.74	67.16	3 48.65	0.022	
Frid.	17	3 32 19.93	9.901	19 7 37.4	34.55	15 50.55	67.24	3 47.84	0.045	
Sat.	18	3 36 17.86	9.924	19 21 16.8	33.74	15 50.37	67.32	3 46.49	0.068	
SUN.	19	3 40 16.32	9.946	19 34 36.6	+ 32.90	15 50.19	67.40	3 44.59	0.090	
Mon.	20	3 44 15.32	9.968	19 47 36.2	32.05	15 50.01	67.48	3 42.15	0.113	
Tues.	21	3 48 14.85	9.990	20 0 15.4	31.21	15 49.83	67.56	3 39.18	0.135	
Wed.	22	3 52 14.91	10.012	20 12 34.4	+ 30.35	15 49.66	67.64	3 35.68	0.156	
Thur.	23	3 56 15.49	10.034	20 24 32.5	29.48	15 49.49	67.72	3 31.67	0.178	
Frid.	24	4 0 16.58	10.056	20 36 9.6	28.60	15 49.32	67.80	3 27.15	0.199	
Sat.	25	4 4 18.17	10.077	20 47 25.5	+ 27.72	15 49.15	67.87	3 22.12	0.220	
SUN.	26	4 8 20.26	10.098	20 58 19.8	26.82	15 48.98	67.94	3 16.60	0.240	
Mon.	27	4 12 22.85	10.118	21 8 52.6	25.91	15 48.82	68.01	3 10.59	0.260	
Tues.	28	4 16 25.92	10.138	21 19 3.4	+ 24.99	15 48.66	68.08	3 4.10	0.280	
Wed.	29	4 20 29.47	10.158	21 28 52.2	24.08	15 48.50	68.15	2 57.13	0.300	
Thur.	30	4 24 33.49	10.177	21 38 18.7	23.15	15 48.35	68.21	2 49.69	0.320	
Frid.	31	4 28 37.97	10.196	21 47 22.8	22.20	15 48.20	68.27	2 41.78	0.339	
Sat.	32	4 32 42.90	10.215	N. 21 56 4.1	+ 21.25	15 48.06	68.33	2 33.42	0.357	

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.18 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Wed.	1	2 30 11.31	9.521	N.14 48 27.5	+45.90	2 52.21	0.335	2 33 3.52
Thur.	2	2 34 0.09	9.545	15 6 41.9	45.28	2 59.99	0.312	2 37 0.08
Frid.	3	2 37 49.43	9.568	15 24 41.4	44.65	3 7.20	0.289	2 40 56.63
Sat.	4	2 41 39.33	9.592	15 42 25.7	+44.01	3 13.85	0.265	2 44 53.18
SUN.	5	2 45 29.81	9.616	15 59 54.6	43.36	3 19.93	0.241	2 48 49.74
Mon.	6	2 49 20.86	9.640	16 17 7.7	42.70	3 25.43	0.217	2 52 46.29
Tues.	7	2 53 12.49	9.664	16 34 4.6	+42.02	3 30.36	0.193	2 56 42.85
Wed.	8	2 57 4.70	9.688	16 50 45.1	41.34	3 34.70	0.169	3 0 39.40
Thur.	9	3 0 57.49	9.712	17 7 8.9	40.64	3 38.47	0.145	3 4 35.96
Frid.	10	3 4 50.87	9.736	17 23 15.7	+39.92	3 41.64	0.120	3 8 32.51
Sat.	11	3 8 44.83	9.760	17 39 5.1	39.19	3 44.24	0.097	3 12 29.07
SUN.	12	3 12 39.36	9.784	17 54 36.8	38.45	3 46.27	0.073	3 16 25.63
Mon.	13	3 16 34.46	9.808	18 9 50.6	+37.69	3 47.72	0.049	3 20 22.18
Tues.	14	3 20 30.15	9.832	18 24 46.0	36.92	3 48.59	0.025	3 24 18.74
Wed.	15	3 24 26.39	9.855	18 39 22.8	36.14	3 48.90	0.001	3 28 15.29
Thur.	16	3 28 23.20	9.878	18 53 40.8	+35.36	3 48.65	0.022	3 32 11.85
Frid.	17	3 32 20.56	9.901	19 7 39.6	34.55	3 47.84	0.045	3 36 8.40
Sat.	18	3 36 18.48	9.924	19 21 18.9	33.73	3 46.48	0.068	3 40 4.96
SUN.	19	3 40 16.94	9.946	19 34 38.6	+32.90	3 44.57	0.090	3 44 1.51
Mon.	20	3 44 15.93	9.968	19 47 38.1	32.05	3 42.14	0.113	3 47 58.07
Tues.	21	3 48 15.46	9.990	20 0 17.4	31.20	3 39.17	0.135	3 51 54.63
Wed.	22	3 52 15.51	10.012	20 12 36.2	+30.35	3 35.67	0.156	3 55 51.18
Thur.	23	3 56 16.08	10.034	20 24 34.2	29.48	3 31.66	0.178	3 59 47.74
Frid.	24	4 0 17.16	10.055	20 36 11.2	28.60	3 27.14	0.199	4 3 44.30
Sat.	25	4 4 18.74	10.076	20 47 27.0	+27.72	3 22.11	0.220	4 7 40.85
SUN.	26	4 8 20.82	10.097	20 58 21.2	26.82	3 16.59	0.240	4 11 37.41
Mon.	27	4 12 23.39	10.117	21 8 53.9	25.91	3 10.57	0.260	4 15 33.96
Tues.	28	4 16 26.44	10.137	21 19 4.6	+24.99	3 4.08	0.280	4 19 30.52
Wed.	29	4 20 29.97	10.157	21 28 53.3	24.08	2 57.11	0.300	4 23 27.08
Thur.	30	4 24 33.97	10.176	21 38 19.7	23.15	2 49.67	0.320	4 27 23.64
Frid.	31	4 28 38.43	10.195	21 47 23.7	22.20	2 41.76	0.339	4 31 20.19
Sat.	32	4 32 43.33	10.213	N.21 56 5.0	+21.25	2 33.42	0.357	4 35 16.75

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour,  
+9°.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	121	39 57 47.2	57 47.3	145.51	+ 0.54	0.003 3632	+ 46.3	h m s 21 23 25.64
2	122	40 55 58.6	55 58.6	145.44	0.41	0.003 4740	46.0	21 19 29.74
3	123	41 54 8.5	54 8.3	145.38	0.28	0.003 5840	45.7	21 15 33.83
4	124	42 52 17.0	52 16.7	145.32	+ 0.14	0.003 6931	+ 45.3	21 11 37.92
5	125	43 50 24.1	50 23.6	145.27	+ 0.01	0.003 8012	44.8	21 7 42.01
6	126	44 48 29.8	48 29.2	145.21	— 0.10	0.003 9081	44.2	21 3 46.10
7	127	45 46 34.1	46 33.4	145.15	— 0.21	0.004 0135	+ 43.6	20 59 50.19
8	128	46 44 37.0	44 36.2	145.09	0.29	0.004 1174	42.9	20 55 54.28
9	129	47 42 38.6	42 37.6	145.03	0.34	0.004 2197	42.2	20 51 58.37
10	130	48 40 38.7	40 37.6	144.97	— 0.35	0.004 3202	+ 41.5	20 48 2.46
11	131	49 38 37.3	38 36.1	144.91	0.34	0.004 4189	40.7	20 44 6.56
12	132	50 36 34.4	36 33.0	144.85	0.30	0.004 5157	40.0	20 40 10.65
13	133	51 34 29.9	34 28.5	144.78	— 0.24	0.004 6107	+ 39.2	20 36 14.74
14	134	52 32 23.9	32 22.3	144.72	0.16	0.004 7037	38.4	20 32 18.83
15	135	53 30 16.3	30 14.6	144.65	— 0.07	0.004 7948	37.6	20 28 22.92
16	136	54 28 7.1	28 5.2	144.59	+ 0.05	0.004 8842	+ 36.8	20 24 27.01
17	137	55 25 56.3	25 54.2	144.52	0.17	0.004 9716	36.1	20 20 31.10
18	138	56 23 43.8	23 41.6	144.45	0.29	0.005 0574	35.4	20 16 35.19
19	139	57 21 29.8	21 27.4	144.38	+ 0.41	0.005 1414	+ 34.7	20 12 39.28
20	140	58 19 14.0	19 11.5	144.31	0.51	0.005 2238	34.0	20 8 43.37
21	141	59 16 56.7	16 54.0	144.24	0.59	0.005 3047	33.4	20 4 47.46
22	142	60 14 37.7	14 35.0	144.17	+ 0.66	0.005 3840	+ 32.8	20 0 51.55
23	143	61 12 17.2	12 14.3	144.11	0.70	0.005 4621	32.3	19 56 55.64
24	144	62 9 55.2	9 52.1	144.05	0.72	0.005 5389	31.8	19 52 59.73
25	145	63 7 31.7	7 28.5	143.99	+ 0.69	0.005 6145	+ 31.3	19 49 3.82
26	146	64 5 6.9	5 3.5	143.94	0.64	0.005 6892	30.9	19 45 7.90
27	147	65 2 40.8	2 37.2	143.89	0.57	0.005 7628	30.5	19 41 11.99
28	148	66 0 13.5	0 9.8	143.84	+ 0.45	0.005 8354	+ 30.1	19 37 16.08
29	149	66 57 45.2	57 41.3	143.80	0.32	0.005 9069	29.6	19 33 20.17
30	150	67 55 15.9	55 11.8	143.76	0.19	0.005 9774	29.1	19 29 24.26
31	151	68 52 45.7	52 41.5	143.73	+ 0.04	0.006 0466	28.6	19 25 28.35
32	152	69 50 14.8	50 10.4	143.70	— 0.10	0.006 1145	+ 28.0	19 21 32.44

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,  
—9<sup>s</sup>.8296.  
(Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	' "	' "	' "	"	' "	"	h m	m	d
1	16 26.4	16 24.3	60 14.2	- 0.49	60 6.8	- 0.73	15 41.9	2.54	18.7
2	16 21.6	16 18.2	59 56.7	0.93	59 44.4	1.10	16 42.7	2.50	19.7
3	16 14.4	16 10.2	59 30.4	1.23	59 14.9	1.33	17 41.7	2.39	20.7
4	16 5.7	16 1.0	58 58.4	- 1.40	58 41.2	- 1.45	18 37.6	2.26	21.7
5	15 56.3	15 51.4	58 23.7	1.47	58 5.9	1.47	19 30.1	2.12	22.7
6	15 46.6	15 41.9	57 48.3	1.46	57 30.9	1.44	20 19.6	2.01	23.7
7	15 37.1	15 32.7	57 13.8	- 1.40	56 57.1	- 1.37	21 6.7	1.93	24.7
8	15 28.3	15 24.0	56 40.9	1.33	56 25.1	1.29	21 52.1	1.88	25.7
9	15 19.8	15 15.8	56 9.9	1.24	55 55.3	1.20	22 36.9	1.86	26.7
10	15 12.0	15 8.4	55 41.2	- 1.15	55 27.7	- 1.09	23 21.7	1.88	27.7
11	15 4.9	15 1.6	55 14.9	1.04	55 2.8	0.97	0	.	28.7
12	14 58.5	14 55.7	54 51.5	0.90	54 41.1	0.83	0 7.0	1.91	0.1
13	14 53.1	14 50.8	54 31.7	- 0.73	54 23.4	- 0.64	0 53.2	1.95	1.1
14	14 48.9	14 47.4	54 16.4	0.53	54 10.8	0.40	1 40.4	1.99	2.1
15	14 46.3	14 45.6	54 6.7	- 0.27	54 4.3	- 0.12	2 28.4	2.01	3.1
16	14 45.5	14 45.9	54 3.8	+ 0.05	54 5.3	+ 0.21	3 17.0	2.02	4.1
17	14 46.9	14 48.5	54 8.9	0.39	54 14.8	0.58	4 5.5	2.01	5.1
18	14 50.7	14 53.6	54 23.0	0.78	54 33.5	0.98	4 53.4	1.99	6.1
19	14 57.1	15 1.4	54 46.5	+ 1.18	55 1.9	+ 1.38	5 40.7	1.96	7.1
20	15 6.2	15 11.6	55 19.7	1.57	55 39.8	1.76	6 27.3	1.93	8.1
21	15 17.7	15 24.3	56 2.0	1.93	56 26.1	2.08	7 13.6	1.93	9.1
22	15 31.3	15 38.6	56 51.8	+ 2.20	57 18.8	+ 2.28	8 0.1	1.96	10.1
23	15 46.2	15 53.9	57 46.7	2.33	58 14.9	2.34	8 47.6	2.01	11.1
24	16 1.5	16 8.9	58 42.8	2.29	59 9.9	2.19	9 36.9	2.11	12.1
25	16 15.8	16 22.2	59 35.5	+ 2.04	59 58.8	+ 1.83	10 29.0	2.24	13.1
26	16 27.8	16 32.4	60 19.4	1.56	60 36.4	1.26	11 24.6	2.40	14.1
27	16 36.0	16 38.4	60 49.6	0.92	60 58.4	+ 0.55	12 24.0	2.54	15.1
28	16 39.5	16 39.4	61 2.7	+ 0.17	61 2.5	- 0.20	13 26.3	2.60	16.1
29	16 38.2	16 35.8	60 57.7	- 0.57	60 48.8	0.90	14 29.6	2.62	17.1
30	16 32.3	16 27.9	60 36.1	1.20	60 20.0	1.45	15 31.9	2.53	18.1
31	16 22.8	16 17.1	60 1.2	1.65	59 40.3	1.81	16 31.1	2.38	19.1
32	16 11.0	16 4.6	59 17.8	- 1.92	58 54.3	- 1.98	17 26.2	2.22	20.1

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 1.					FRIDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	17 36 36.88	2.5971	S. 20 40 0.2	4.218	0	19 40 58.68	2.5434	S. 21 9 22.7	2.938
1	17 39 12.75	2.5984	20 44 8.9	4.072	1	19 43 31.18	2.5398	21 6 22.2	3.077
2	17 41 48.69	2.5998	20 48 8.8	3.924	2	19 46 3.46	2.5361	21 3 13.4	3.217
3	17 44 24.72	2.6011	20 51 59.8	3.775	3	19 48 35.51	2.5323	20 59 56.2	3.355
4	17 47 0.82	2.6022	20 55 41.8	3.627	4	19 51 7.34	2.5286	20 56 30.8	3.492
5	17 49 36.98	2.6032	20 59 15.0	3.478	5	19 53 38.94	2.5247	20 52 57.2	3.628
6	17 52 13.20	2.6041	21 2 39.2	3.327	6	19 56 10.30	2.5207	20 49 15.4	3.764
7	17 54 49.47	2.6049	21 5 54.3	3.177	7	19 58 41.42	2.5166	20 45 25.5	3.899
8	17 57 25.79	2.6056	21 9 0.5	3.027	8	20 1 12.29	2.5125	20 41 27.5	4.033
9	18 0 2.14	2.6062	21 11 57.6	2.877	9	20 3 42.92	2.5083	20 37 21.5	4.166
10	18 2 38.53	2.6067	21 14 45.7	2.726	10	20 6 13.29	2.5041	20 33 7.6	4.297
11	18 5 14.94	2.6070	21 17 24.7	2.574	11	20 8 43.41	2.4997	20 28 45.8	4.428
12	18 7 51.37	2.6072	21 19 54.6	2.422	12	20 11 13.26	2.4953	20 24 16.2	4.558
13	18 10 27.81	2.6074	21 22 15.4	2.271	13	20 13 42.85	2.4909	20 19 38.8	4.687
14	18 13 4.26	2.6074	21 24 27.1	2.119	14	20 16 12.17	2.4864	20 14 53.7	4.815
15	18 15 40.70	2.6072	21 26 29.7	1.967	15	20 18 41.22	2.4818	20 10 1.0	4.942
16	18 18 17.13	2.6071	21 28 23.2	1.815	16	20 21 9.99	2.4772	20 5 0.6	5.069
17	18 20 53.55	2.6068	21 30 7.5	1.662	17	20 23 38.48	2.4726	19 59 52.7	5.193
18	18 23 29.94	2.6063	21 31 42.7	1.510	18	20 26 6.70	2.4679	19 54 37.4	5.317
19	18 26 6.31	2.6058	21 33 8.7	1.357	19	20 28 34.63	2.4631	19 49 14.7	5.440
20	18 28 42.64	2.6052	21 34 25.6	1.206	20	20 31 2.27	2.4582	19 43 44.6	5.562
21	18 31 18.93	2.6044	21 35 33.4	1.054	21	20 33 29.62	2.4534	19 38 7.2	5.682
22	18 33 55.17	2.6035	21 36 32.1	0.902	22	20 35 56.68	2.4486	19 32 22.7	5.802
23	18 36 31.35	2.6025	S. 21 37 21.6	0.749	23	20 38 23.45	2.4437	S. 19 26 31.0	5.921
THURSDAY 2.					SATURDAY 4.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	18 39 7.47	2.6014	S. 21 38 2.0	0.597	0	20 40 49.92	2.4387	S. 19 20 32.2	6.038
1	18 41 43.52	2.6002	21 38 33.3	0.445	1	20 43 16.09	2.4337	19 14 26.4	6.154
2	18 44 19.49	2.5988	21 38 55.4	0.293	2	20 45 41.96	2.4287	19 8 13.7	6.268
3	18 46 55.38	2.5974	21 39 8.5	-0.142	3	20 48 7.53	2.4236	19 1 54.2	6.382
4	18 49 31.18	2.5958	21 39 12.5	+0.008	4	20 50 32.79	2.4185	18 55 27.8	6.496
5	18 52 6.88	2.5942	21 39 7.5	0.159	5	20 52 57.75	2.4134	18 48 54.7	6.607
6	18 54 42.48	2.5924	21 38 53.4	0.311	6	20 55 22.40	2.4082	18 42 15.0	6.717
7	18 57 17.97	2.5906	21 38 30.2	0.461	7	20 57 46.74	2.4031	18 35 28.7	6.827
8	18 59 53.35	2.5887	21 37 58.1	0.610	8	21 0 10.77	2.3978	18 28 35.8	6.935
9	19 2 28.61	2.5866	21 37 17.0	0.760	9	21 2 34.48	2.3927	18 21 36.5	7.041
10	19 5 3.74	2.5843	21 36 26.9	0.909	10	21 4 57.89	2.3875	18 14 30.9	7.147
11	19 7 38.73	2.5820	21 35 27.9	1.057	11	21 7 20.98	2.3822	18 7 18.9	7.252
12	19 10 13.58	2.5797	21 34 20.0	1.206	12	21 9 43.76	2.3770	18 0 0.7	7.354
13	19 12 48.29	2.5772	21 33 3.2	1.353	13	21 12 6.22	2.3717	17 52 36.4	7.457
14	19 15 22.84	2.5745	21 31 37.6	1.500	14	21 14 28.37	2.3665	17 45 5.9	7.558
15	19 17 57.23	2.5718	21 30 3.2	1.647	15	21 16 50.20	2.3612	17 37 29.4	7.657
16	19 20 31.46	2.5690	21 28 20.0	1.793	16	21 19 11.71	2.3558	17 29 47.0	7.755
17	19 23 5.51	2.5661	21 26 28.0	1.939	17	21 21 32.90	2.3506	17 21 58.8	7.852
18	19 25 39.39	2.5632	21 24 27.3	2.083	18	21 23 53.78	2.3453	17 14 4.7	7.949
19	19 28 13.09	2.5602	21 22 18.0	2.227	19	21 26 14.34	2.3400	17 6 4.9	8.044
20	19 30 46.61	2.5570	21 20 0.0	2.371	20	21 28 34.58	2.3347	16 57 59.4	8.137
21	19 33 19.93	2.5537	21 17 33.5	2.513	21	21 30 54.51	2.3291	16 49 48.4	8.229
22	19 35 53.05	2.5503	21 14 58.4	2.656	22	21 33 14.11	2.3241	16 41 31.9	8.321
23	19 38 25.97	2.5469	21 12 14.8	2.797	23	21 35 33.40	2.3188	16 33 9.9	8.411
24	19 40 58.68	2.5434	S. 21 9 22.7	2.938	24	21 37 52.37	2.3136	S. 16 24 42.6	8.499



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 5.					TUESDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	21 37 52.37	2.3136	S. 16 24 42.6	8.499	0	23 23 17.78	2.0929	S. 8 17 28.1	11.357
1	21 40 11.03	2.3083	16 16 10.0	8.587	1	23 25 23.25	2.0893	8 6 5.7	11.390
2	21 42 29.37	2.3030	16 7 32.2	8.672	2	23 27 28.50	2.0858	7 54 41.3	11.422
3	21 44 47.39	2.2977	15 58 49.3	8.757	3	23 29 33.55	2.0824	7 43 15.1	11.451
4	21 47 5.10	2.2926	15 50 1.3	8.841	4	23 31 38.39	2.0789	7 31 47.2	11.479
5	21 49 22.50	2.2874	15 41 8.4	8.923	5	23 33 43.02	2.0756	7 20 17.6	11.507
6	21 51 39.59	2.2822	15 32 10.5	9.006	6	23 35 47.46	2.0723	7 8 46.3	11.535
7	21 53 56.36	2.2770	15 23 7.7	9.086	7	23 37 51.70	2.0691	6 57 13.4	11.561
8	21 56 12.83	2.2718	15 14 0.2	9.164	8	23 39 55.75	2.0658	6 45 39.0	11.585
9	21 58 28.98	2.2667	15 4 48.0	9.243	9	23 41 59.60	2.0627	6 34 3.2	11.609
10	22 0 44.83	2.2616	14 55 31.2	9.318	10	23 44 3.27	2.0597	6 22 25.9	11.632
11	22 3 0.37	2.2565	14 46 9.8	9.393	11	23 46 6.76	2.0566	6 10 47.3	11.654
12	22 5 15.61	2.2514	14 36 44.0	9.467	12	23 48 10.06	2.0536	5 59 7.4	11.675
13	22 7 30.54	2.2463	14 27 13.8	9.540	13	23 50 13.19	2.0507	5 47 26.3	11.695
14	22 9 45.17	2.2413	14 17 39.2	9.612	14	23 52 16.14	2.0477	5 35 44.0	11.714
15	22 11 59.50	2.2363	14 8 0.4	9.682	15	23 54 18.92	2.0449	5 24 0.6	11.732
16	22 14 13.53	2.2313	13 58 17.4	9.751	16	23 56 21.53	2.0422	5 12 16.2	11.748
17	22 16 27.26	2.2264	13 48 30.3	9.819	17	23 58 23.98	2.0394	5 0 30.8	11.764
18	22 18 40.70	2.2216	13 38 39.1	9.887	18	0 0 26.26	2.0367	4 48 44.5	11.779
19	22 20 53.85	2.2167	13 28 43.9	9.952	19	0 2 28.39	2.0342	4 36 57.3	11.794
20	22 23 6.70	2.2118	13 18 44.9	10.016	20	0 4 30.36	2.0316	4 25 9.2	11.807
21	22 25 19.27	2.2070	13 8 42.0	10.080	21	0 6 32.18	2.0292	4 13 20.4	11.819
22	22 27 31.54	2.2022	12 58 35.3	10.142	22	0 8 33.86	2.0267	4 1 30.9	11.830
23	22 29 43.53	2.1975	S. 12 48 25.0	10.202	23	0 10 35.39	2.0242	S. 3 49 40.8	11.840
MONDAY 6.					WEDNESDAY 8.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	22 31 55.24	2.1928	S. 12 38 11.1	10.262	0	0 12 36.77	2.0219	S. 3 37 50.1	11.850
1	22 34 6.67	2.1882	12 27 53.6	10.321	1	0 14 38.02	2.0197	3 25 58.8	11.858
2	22 36 17.82	2.1835	12 17 32.6	10.378	2	0 16 39.13	2.0174	3 14 7.1	11.865
3	22 38 28.69	2.1789	12 7 8.2	10.434	3	0 18 40.11	2.0152	3 2 15.0	11.872
4	22 40 39.29	2.1743	11 56 40.5	10.489	4	0 20 40.96	2.0131	2 50 22.5	11.877
5	22 42 49.61	2.1698	11 46 9.5	10.543	5	0 22 41.68	2.0110	2 38 29.7	11.882
6	22 44 59.67	2.1655	11 35 35.3	10.596	6	0 24 42.28	2.0090	2 26 36.6	11.887
7	22 47 9.47	2.1611	11 24 58.0	10.647	7	0 26 42.76	2.0070	2 14 43.3	11.889
8	22 49 19.00	2.1566	11 14 17.6	10.698	8	0 28 43.12	2.0051	2 2 49.9	11.891
9	22 51 28.26	2.1522	11 3 34.2	10.748	9	0 30 43.37	2.0032	1 50 56.4	11.892
10	22 53 37.27	2.1480	10 52 47.8	10.797	10	0 32 43.51	2.0014	1 39 2.9	11.892
11	22 55 46.02	2.1437	10 41 58.5	10.844	11	0 34 43.54	1.9997	1 27 9.4	11.891
12	22 57 54.52	2.1396	10 31 6.5	10.889	12	0 36 43.47	1.9980	1 15 16.0	11.889
13	23 0 2.77	2.1354	10 20 11.8	10.934	13	0 38 43.30	1.9963	1 3 22.7	11.887
14	23 2 10.77	2.1312	10 9 14.4	10.978	14	0 40 43.03	1.9947	0 51 29.6	11.883
15	23 4 18.52	2.1272	9 58 14.4	11.022	15	0 42 42.67	1.9932	0 39 36.7	11.879
16	23 6 26.04	2.1232	9 47 11.8	11.063	16	0 44 42.22	1.9917	0 27 44.1	11.874
17	23 8 33.31	2.1192	9 36 6.8	11.103	17	0 46 41.68	1.9902	0 15 51.8	11.868
18	23 10 40.35	2.1153	9 24 59.4	11.143	18	0 48 41.05	1.9888	S. 0 3 59.9	11.861
19	23 12 47.15	2.1115	9 13 49.6	11.182	19	0 50 40.34	1.9875	N. 0 7 51.5	11.853
20	23 14 53.73	2.1077	9 2 37.6	11.218	20	0 52 39.55	1.9862	0 19 42.5	11.845
21	23 17 0.08	2.1039	8 51 23.4	11.255	21	0 54 38.69	1.9850	0 31 32.9	11.835
22	23 19 6.20	2.1002	8 40 7.0	11.290	22	0 56 37.75	1.9837	0 43 22.7	11.825
23	23 21 12.10	2.0965	8 28 48.6	11.324	23	0 58 36.74	1.9826	0 55 11.9	11.813
24	23 23 17.78	2.0929	S. 8 17 28.1	11.357	24	1 0 35.66	1.9815	N. 1 7 0.3	11.801

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 9.					SATURDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	1 0 35.66	1.9815	N. 1 7 0.3	11.801	1	2 35 20.19	1.9818	N. 10 4 3.1	10.276
2	1 2 34.52	1.9806	1 18 48.0	11.788	2	2 37 19.13	1.9827	10 14 18.2	10.286
3	1 4 33.33	1.9796	1 30 34.9	11.775	3	2 39 18.12	1.9837	10 24 30.2	10.174
4	1 6 32.07	1.9786	1 42 21.0	11.760	4	2 41 17.17	1.9847	10 34 39.1	10.122
5	1 8 30.76	1.9777	1 54 6.1	11.744	5	2 43 16.28	1.9857	10 44 44.9	10.070
6	1 10 29.40	1.9769	2 5 50.3	11.728	6	2 45 15.46	1.9867	10 54 47.5	10.017
7	1 12 27.99	1.9762	2 17 33.5	11.711	7	2 47 14.69	1.9877	11 4 46.9	9.962
8	1 14 26.54	1.9754	2 29 15.6	11.693	8	2 49 13.99	1.9889	11 14 43.0	9.908
9	1 16 25.04	1.9747	2 40 56.7	11.675	9	2 51 13.36	1.9900	11 24 35.9	9.853
10	1 18 23.50	1.9740	2 52 36.6	11.655	10	2 53 12.79	1.9911	11 34 25.4	9.797
11	1 20 21.92	1.9734	3 4 15.3	11.634	11	2 55 12.29	1.9923	11 44 11.5	9.740
12	1 22 20.31	1.9729	3 15 52.7	11.612	12	2 57 11.87	1.9935	11 53 54.2	9.682
13	1 24 18.67	1.9724	3 27 28.8	11.591	13	2 59 11.51	1.9947	12 3 33.4	9.624
14	1 26 17.00	1.9720	3 39 3.6	11.568	14	3 1 11.23	1.9960	12 13 9.1	9.565
15	1 28 15.31	1.9716	3 50 37.0	11.544	15	3 3 11.03	1.9972	12 22 41.3	9.507
16	1 30 13.59	1.9712	4 2 8.9	11.519	16	3 5 10.90	1.9985	12 32 9.9	9.447
17	1 32 11.85	1.9708	4 13 39.3	11.494	17	3 7 10.85	1.9997	12 41 34.9	9.386
18	1 34 10.09	1.9705	4 25 8.2	11.468	18	3 9 10.87	2.0011	12 50 56.2	9.324
19	1 36 8.31	1.9703	4 36 35.5	11.442	19	3 11 10.98	2.0024	13 0 13.8	9.262
20	1 38 6.53	1.9702	4 48 1.2	11.414	20	3 13 11.16	2.0037	13 9 27.7	9.199
21	1 40 4.73	1.9700	4 59 25.2	11.385	21	3 15 11.43	2.0052	13 18 37.7	9.136
22	1 42 2.93	1.9699	5 10 47.4	11.356	22	3 17 11.78	2.0066	13 27 44.0	9.072
23	1 44 1.12	1.9697	5 22 7.9	11.326	23	3 19 12.22	2.0080	13 36 46.4	9.007
24	1 45 59.30	1.9697	N. 5 33 26.5	11.294	24	3 21 12.74	2.0093	N. 13 45 44.9	8.942
FRIDAY 10.					SUNDAY 12.				
0	1 47 57.49	1.9698	N. 5 44 43.2	11.263	0	3 23 13.34	2.0107	N. 13 54 39.4	8.876
1	1 49 55.68	1.9699	5 55 58.0	11.231	1	3 25 14.03	2.0122	14 3 30.0	8.809
2	1 51 53.88	1.9700	6 7 10.9	11.197	2	3 27 14.81	2.0137	14 12 16.5	8.742
3	1 53 52.08	1.9702	6 18 21.7	11.163	3	3 29 15.68	2.0152	14 20 59.0	8.675
4	1 55 50.30	1.9704	6 29 30.5	11.128	4	3 31 16.64	2.0167	14 29 37.5	8.607
5	1 57 48.53	1.9706	6 40 37.1	11.092	5	3 33 17.69	2.0182	14 38 11.8	8.537
6	1 59 46.77	1.9708	6 51 41.6	11.057	6	3 35 18.83	2.0198	14 46 41.9	8.467
7	2 1 45.03	1.9712	7 2 44.0	11.021	7	3 37 20.07	2.0213	14 55 7.8	8.397
8	2 3 43.31	1.9715	7 13 44.1	10.982	8	3 39 21.39	2.0228	15 3 29.5	8.326
9	2 5 41.61	1.9718	7 24 41.8	10.943	9	3 41 22.81	2.0244	15 11 46.9	8.254
10	2 7 39.93	1.9722	7 35 37.3	10.905	10	3 43 24.32	2.0259	15 20 0.0	8.182
11	2 9 38.28	1.9727	7 46 30.4	10.864	11	3 45 25.92	2.0275	15 28 8.7	8.109
12	2 11 36.66	1.9732	7 57 21.0	10.823	12	3 47 27.62	2.0291	15 36 13.1	8.036
13	2 13 35.07	1.9737	8 8 9.2	10.782	13	3 49 29.41	2.0307	15 44 13.0	7.962
14	2 15 33.51	1.9743	8 18 54.8	10.739	14	3 51 31.30	2.0322	15 52 8.5	7.887
15	2 17 31.99	1.9750	8 29 37.9	10.697	15	3 53 33.28	2.0338	15 59 59.5	7.812
16	2 19 30.51	1.9756	8 40 18.4	10.652	16	3 55 35.36	2.0355	16 7 46.0	7.737
17	2 21 29.06	1.9762	8 50 56.2	10.608	17	3 57 37.54	2.0371	16 15 27.9	7.660
18	2 23 27.65	1.9769	9 1 31.4	10.563	18	3 59 39.81	2.0387	16 23 5.2	7.583
19	2 25 26.29	1.9777	9 12 3.8	10.517	19	4 1 42.18	2.0402	16 30 37.9	7.507
20	2 27 24.97	1.9784	9 22 33.4	10.470	20	4 3 44.64	2.0418	16 38 6.0	7.429
21	2 29 23.70	1.9792	9 33 0.2	10.422	21	4 5 47.20	2.0435	16 45 29.4	7.350
22	2 31 22.48	1.9801	9 43 24.1	10.374	22	4 7 49.86	2.0451	16 52 48.0	7.271
23	2 33 21.31	1.9809	9 53 45.1	10.325	23	4 9 52.61	2.0467	17 0 1.9	7.192
24	2 35 20.19	1.9818	N. 10 4 3.1	10.276	24	4 11 55.46	2.0483	N. 17 7 11.0	7.112

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 13.					WEDNESDAY 15.				
0	h m s	° ' "	N. 17° 7' 11.0	7.112	0	h m s	° ' "	N. 21° 7' 34.9	2.759
1	4 11 55.46	2.0483	17 14 15.3	7.032	1	5 51 54.47	2.1111	21 10 17.5	2.661
2	4 13 58.41	2.0499	17 21 14.8	6.950	2	5 54 1.16	2.1118	21 12 54.2	2.562
3	4 16 1.45	2.0515	17 28 9.3	6.868	3	5 56 7.89	2.1125	21 15 24.9	2.462
4	4 18 4.59	2.0531	17 34 59.0	6.787	4	5 58 14.66	2.1132	21 17 49.7	2.364
5	4 20 7.82	2.0547	17 41 43.7	6.703	5	6 0 21.48	2.1139	21 20 8.6	2.265
6	4 22 11.15	2.0562	17 48 23.4	6.620	6	6 2 28.33	2.1146	21 22 21.5	2.166
7	4 24 14.57	2.0578	17 54 58.1	6.537	7	6 4 35.23	2.1152	21 24 28.5	2.067
8	4 26 18.09	2.0595	18 1 27.8	6.453	8	6 6 42.16	2.1157	21 26 29.5	1.966
9	4 28 21.71	2.0611	18 7 52.5	6.368	9	6 8 49.12	2.1163	21 28 24.4	1.866
10	4 30 25.42	2.0626	18 14 12.0	6.282	10	6 10 56.12	2.1169	21 30 13.4	1.767
11	4 32 29.22	2.0641	18 20 26.4	6.197	11	6 13 3.15	2.1174	21 31 56.4	1.667
12	4 34 33.11	2.0657	18 26 35.7	6.112	12	6 15 10.21	2.1179	21 33 33.4	1.567
13	4 36 37.10	2.0672	18 32 39.8	6.025	13	6 17 17.30	2.1183	21 35 4.4	1.466
14	4 38 41.18	2.0687	18 38 38.7	5.937	14	6 19 24.41	2.1188	21 36 29.3	1.365
15	4 40 45.35	2.0702	18 44 32.3	5.850	15	6 21 31.55	2.1192	21 37 48.2	1.265
16	4 42 49.61	2.0717	18 50 20.7	5.762	16	6 23 38.71	2.1197	21 39 1.1	1.164
17	4 44 53.96	2.0732	18 56 3.8	5.674	17	6 25 45.88	2.1197	21 40 7.9	1.062
18	4 46 58.40	2.0747	19 1 41.6	5.586	18	6 27 53.08	2.1201	21 41 8.6	0.962
19	4 49 2.93	2.0762	19 7 14.1	5.497	19	6 30 0.29	2.1203	21 42 3.3	0.862
20	4 51 7.55	2.0777	19 12 41.2	5.407	20	6 32 7.51	2.1207	21 42 52.0	0.762
21	4 53 12.25	2.0791	19 18 2.9	5.317	21	6 34 14.74	2.1209	21 43 34.7	0.660
22	4 55 17.04	2.0805	19 23 19.2	5.227	22	6 36 21.99	2.1210	21 44 11.2	0.558
23	4 57 21.91	2.0819	N. 19° 28' 30.1	5.136	23	6 38 29.25	2.1210	N. 21° 44' 41.7	0.457
24	4 59 26.87	2.0833				6 40 36.51	2.1210		
TUESDAY 14.					THURSDAY 16.				
0	h m s	° ' "	N. 19° 33' 35.5	5.045	0	h m s	° ' "	N. 21° 45' 6.1	0.356
1	5 1 31.91	2.0847	19 38 35.5	4.953	1	6 42 43.77	2.1211	21 45 24.4	0.255
2	5 3 37.03	2.0860	19 43 29.9	4.861	2	6 44 51.04	2.1212	21 45 36.7	0.154
3	5 5 42.23	2.0874	19 48 18.8	4.769	3	6 46 58.31	2.1212	21 45 42.9	+ 0.053
4	5 7 47.52	2.0887	19 53 2.2	4.677	4	6 49 5.58	2.1211	21 45 43.1	- 0.048
5	5 9 52.88	2.0900	19 57 40.0	4.583	5	6 51 12.84	2.1210	21 45 37.1	0.150
6	5 11 58.32	2.0912	20 2 12.2	4.490	6	6 53 20.10	2.1209	21 45 25.1	0.250
7	5 14 3.83	2.0924	20 6 38.8	4.397	7	6 55 27.35	2.1208	21 45 7.1	0.351
8	5 16 9.41	2.0937	20 10 59.8	4.302	8	6 57 34.60	2.1207	21 44 43.0	0.452
9	5 18 15.07	2.0950	20 15 15.1	4.208	9	6 59 41.83	2.1204	21 44 12.8	0.553
10	5 20 20.81	2.0962	20 19 24.8	4.113	10	7 1 49.05	2.1203	21 43 36.6	0.654
11	5 22 26.61	2.0972	20 23 28.7	4.018	11	7 3 56.26	2.1201	21 42 54.3	0.756
12	5 24 32.48	2.0984	20 27 27.0	3.923	12	7 6 3.46	2.1198	21 42 5.9	0.857
13	5 26 38.42	2.0996	20 31 19.5	3.827	13	7 8 10.63	2.1194	21 41 11.5	0.957
14	5 28 44.43	2.1007	20 35 6.3	3.732	14	7 10 17.79	2.1191	21 40 11.1	1.057
15	5 30 50.50	2.1017	20 38 47.3	3.636	15	7 12 24.92	2.1187	21 39 4.6	1.158
16	5 32 56.64	2.1028	20 42 22.6	3.540	16	7 14 32.03	2.1183	21 37 52.1	1.258
17	5 35 2.84	2.1038	20 45 52.1	3.444	17	7 16 39.12	2.1179	21 36 33.6	1.358
18	5 37 9.10	2.1048	20 49 15.7	3.346	18	7 18 46.18	2.1174	21 35 9.1	1.459
19	5 39 15.42	2.1057	20 52 33.6	3.249	19	7 20 53.21	2.1169	21 33 38.5	1.560
20	5 41 21.79	2.1067	20 55 45.6	3.151	20	7 23 0.21	2.1164	21 32 1.9	1.659
21	5 43 28.22	2.1077	20 58 51.7	3.053	21	7 25 7.18	2.1159	21 30 19.4	1.759
22	5 45 34.71	2.1086	21 1 52.0	2.956	22	7 27 14.12	2.1154	21 28 30.8	1.860
23	5 47 41.25	2.1093	21 4 46.4	2.857	23	7 29 21.03	2.1148	21 26 36.2	1.959
24	5 49 47.83	2.1102	N. 21° 7' 34.9	2.759	24	7 31 27.90	2.1142		
	5 51 54.47	2.1111				7 33 34.73	2.1135		

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 17.					SUNDAY 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 33 34.73	2.1135	N. 21 24 35.7	2.058	0	9 13 57.03	2.0647	N. 17 55 13.1	6.557
1	7 35 41.52	2.1128	21 22 29.2	2.158	1	9 16 0.88	2.0636	17 48 37.1	6.643
2	7 37 48.27	2.1122	21 20 16.7	2.257	2	9 18 4.66	2.0624	17 41 55.9	6.729
3	7 39 54.98	2.1115	21 17 58.3	2.357	3	9 20 8.37	2.0613	17 35 9.6	6.814
4	7 42 1.65	2.1107	21 15 33.9	2.456	4	9 22 12.02	2.0602	17 28 18.2	6.899
5	7 44 8.27	2.1100	21 13 3.6	2.554	5	9 24 15.60	2.0592	17 21 21.7	6.984
6	7 46 14.85	2.1092	21 10 27.4	2.652	6	9 26 19.12	2.0581	17 14 20.1	7.067
7	7 48 21.38	2.1084	21 7 45.3	2.751	7	9 28 22.57	2.0570	17 7 13.6	7.151
8	7 50 27.86	2.1076	21 4 57.3	2.849	8	9 30 25.96	2.0560	17 0 2.0	7.234
9	7 52 34.29	2.1067	21 2 3.4	2.947	9	9 32 29.29	2.0549	16 52 45.5	7.317
10	7 54 40.67	2.1059	20 59 3.7	3.044	10	9 34 32.55	2.0539	16 45 24.0	7.399
11	7 56 47.00	2.1050	20 55 58.1	3.142	11	9 36 35.76	2.0529	16 37 57.6	7.481
12	7 58 53.27	2.1041	20 52 46.6	3.240	12	9 38 38.90	2.0518	16 30 26.3	7.562
13	8 0 59.49	2.1032	20 49 29.3	3.337	13	9 40 41.98	2.0509	16 22 50.1	7.643
14	8 3 5.65	2.1022	20 46 6.2	3.433	14	9 42 45.01	2.0499	16 15 9.1	7.723
15	8 5 11.76	2.1013	20 42 37.3	3.531	15	9 44 47.97	2.0489	16 7 23.3	7.803
16	8 7 17.81	2.1003	20 39 2.5	3.627	16	9 46 50.88	2.0481	15 59 32.7	7.883
17	8 9 23.80	2.0993	20 35 22.0	3.722	17	9 48 53.74	2.0472	15 51 37.3	7.963
18	8 11 29.73	2.0983	20 31 35.8	3.818	18	9 50 56.54	2.0462	15 43 37.1	8.042
19	8 13 35.60	2.0973	20 27 43.8	3.915	19	9 52 59.29	2.0453	15 35 32.3	8.120
20	8 15 41.41	2.0963	20 23 46.0	4.010	20	9 55 1.98	2.0445	15 27 22.7	8.198
21	8 17 47.16	2.0952	20 19 42.6	4.105	21	9 57 4.63	2.0437	15 19 8.5	8.275
22	8 19 52.84	2.0942	20 15 33.4	4.200	22	9 59 7.22	2.0428	15 10 49.7	8.353
23	8 21 58.46	2.0932	N. 20 11 18.6	4.294	23	10 1 9.77	2.0421	N. 15 2 26.2	8.429
SATURDAY 18.					MONDAY 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	8 24 4.02	2.0921	N. 20 6 58.1	4.389	0	10 3 12.27	2.0413	N. 14 53 58.2	8.505
1	8 26 9.51	2.0910	20 2 31.9	4.482	1	10 5 14.72	2.0406	14 45 25.6	8.581
2	8 28 14.94	2.0899	19 58 0.2	4.576	2	10 7 17.14	2.0399	14 36 48.5	8.656
3	8 30 20.30	2.0887	19 53 22.8	4.671	3	10 9 19.51	2.0392	14 28 6.9	8.730
4	8 32 25.59	2.0877	19 48 39.7	4.764	4	10 11 21.84	2.0385	14 19 20.9	8.804
5	8 34 30.82	2.0866	19 43 51.1	4.856	5	10 13 24.13	2.0378	14 10 30.4	8.878
6	8 36 35.98	2.0854	19 38 57.0	4.948	6	10 15 26.38	2.0372	14 1 35.5	8.952
7	8 38 41.07	2.0844	19 33 57.3	5.042	7	10 17 28.60	2.0367	13 52 36.2	9.024
8	8 40 46.09	2.0831	19 28 52.0	5.133	8	10 19 30.78	2.0361	13 43 32.6	9.097
9	8 42 51.04	2.0820	19 23 41.3	5.224	9	10 21 32.93	2.0357	13 34 24.6	9.168
10	8 44 55.93	2.0809	19 18 25.1	5.316	10	10 23 35.06	2.0352	13 25 12.4	9.239
11	8 47 0.75	2.0797	19 13 3.4	5.407	11	10 25 37.15	2.0347	13 15 55.9	9.310
12	8 49 5.49	2.0785	19 7 36.2	5.498	12	10 27 39.22	2.0343	13 6 35.2	9.380
13	8 51 10.17	2.0773	19 2 3.6	5.588	13	10 29 41.26	2.0339	12 57 10.3	9.450
14	8 53 14.77	2.0762	18 56 25.6	5.677	14	10 31 43.29	2.0336	12 47 41.2	9.519
15	8 55 19.31	2.0751	18 50 42.3	5.767	15	10 33 45.29	2.0332	12 38 8.0	9.587
16	8 57 23.78	2.0739	18 44 53.5	5.857	16	10 35 47.27	2.0328	12 28 30.7	9.656
17	8 59 28.18	2.0727	18 38 59.4	5.946	17	10 37 49.23	2.0326	12 18 49.3	9.723
18	9 1 32.51	2.0716	18 33 0.0	6.034	18	10 39 51.18	2.0324	12 9 3.9	9.790
19	9 3 36.77	2.0704	18 26 55.3	6.122	19	10 41 53.12	2.0323	11 59 14.5	9.857
20	9 5 40.96	2.0692	18 20 45.3	6.210	20	10 43 55.06	2.0322	11 49 21.1	9.923
21	9 7 45.08	2.0681	18 14 30.1	6.297	21	10 45 56.98	2.0319	11 39 23.7	9.988
22	9 9 49.13	2.0669	18 8 9.6	6.384	22	10 47 58.89	2.0319	11 29 22.5	10.052
23	9 11 53.11	2.0658	18 1 44.0	6.471	23	10 50 0.81	2.0319	11 19 17.4	10.117
24	9 13 57.03	2.0647	N. 17 55 13.1	6.557	24	10 52 2.72	2.0318	N. 11 9 8.5	10.180

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 21.					THURSDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	10 52 2.72	2.0318	N. 11 9 8.5	10.180	0	12 30 26.27	2.0873	N. 1 59 28.0	12.440
1	10 54 4.63	2.0319	10 58 55.8	10.243	1	12 32 31.58	2.0897	1 47 0.8	12.467
2	10 56 6.55	2.0320	10 48 39.3	10.306	2	12 34 37.04	2.0922	1 34 31.9	12.494
3	10 58 8.47	2.0321	10 38 19.1	10.367	3	12 36 42.65	2.0948	1 22 1.5	12.519
4	11 0 10.40	2.0323	10 27 55.2	10.429	4	12 38 48.42	2.0975	1 9 29.6	12.543
5	11 2 12.35	2.0325	10 17 27.6	10.489	5	12 40 54.35	2.1002	0 56 56.3	12.567
6	11 4 14.30	2.0327	10 6 56.4	10.550	6	12 43 0.44	2.1030	0 44 21.6	12.589
7	11 6 16.27	2.0330	9 56 21.6	10.609	7	12 45 6.71	2.1058	0 31 45.6	12.610
8	11 8 18.26	2.0333	9 45 43.3	10.667	8	12 47 13.14	2.1087	0 19 8.4	12.631
9	11 10 20.27	2.0337	9 35 1.5	10.726	9	12 49 19.75	2.1116	N. 0 6 29.9	12.651
10	11 12 22.31	2.0342	9 24 16.2	10.784	10	12 51 26.53	2.1146	S. 0 6 9.7	12.668
11	11 14 24.37	2.0346	9 13 27.4	10.842	11	12 53 33.50	2.1177	0 18 50.3	12.685
12	11 16 26.46	2.0351	9 2 35.2	10.898	12	12 55 40.65	2.1207	0 31 31.9	12.702
13	11 18 28.58	2.0357	8 51 39.7	10.953	13	12 57 47.99	2.1239	0 44 14.5	12.717
14	11 20 30.74	2.0363	8 40 40.8	11.008	14	12 59 55.52	2.1272	0 56 57.9	12.730
15	11 22 32.94	2.0369	8 29 38.7	11.062	15	13 2 3.25	2.1305	1 9 42.1	12.743
16	11 24 35.17	2.0376	8 18 33.3	11.117	16	13 4 11.18	2.1338	1 22 27.1	12.755
17	11 26 37.45	2.0384	8 7 24.7	11.170	17	13 6 19.31	2.1372	1 35 12.7	12.765
18	11 28 39.78	2.0392	7 56 12.9	11.222	18	13 8 27.64	2.1406	1 47 58.9	12.774
19	11 30 42.16	2.0400	7 44 58.0	11.274	19	13 10 36.18	2.1442	2 0 45.6	12.782
20	11 32 44.58	2.0408	7 33 40.0	11.325	20	13 12 44.94	2.1478	2 13 32.8	12.789
21	11 34 47.06	2.0419	7 22 19.0	11.375	21	13 14 53.92	2.1514	2 26 20.3	12.795
22	11 36 49.61	2.0429	7 10 55.0	11.424	22	13 17 3.11	2.1551	2 39 8.2	12.800
23	11 38 52.21	2.0438	N. 6 59 28.1	11.473	23	13 19 12.53	2.1588	S. 2 51 56.3	12.803
WEDNESDAY 22.					FRIDAY 24.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	11 40 54.87	2.0449	N. 6 47 58.2	11.522	0	13 21 22.17	2.1627	S. 3 4 44.6	12.806
1	11 42 57.60	2.0461	6 36 25.5	11.569	1	13 23 32.05	2.1666	3 17 33.0	12.806
2	11 45 0.40	2.0473	6 24 49.9	11.616	2	13 25 42.16	2.1704	3 30 21.3	12.805
3	11 47 3.28	2.0486	6 13 11.6	11.662	3	13 27 52.50	2.1744	3 43 9.6	12.804
4	11 49 6.23	2.0498	6 1 30.5	11.707	4	13 30 3.09	2.1785	3 55 57.8	12.802
5	11 51 9.26	2.0512	5 49 46.7	11.752	5	13 32 13.92	2.1826	4 8 45.8	12.797
6	11 53 12.37	2.0526	5 38 0.3	11.795	6	13 34 25.00	2.1868	4 21 33.4	12.791
7	11 55 15.57	2.0541	5 26 11.3	11.838	7	13 36 36.34	2.1910	4 34 20.7	12.785
8	11 57 18.86	2.0556	5 14 19.7	11.881	8	13 38 47.92	2.1952	4 47 7.6	12.777
9	11 59 22.24	2.0572	5 2 25.6	11.922	9	13 40 59.76	2.1996	4 59 53.9	12.767
10	12 1 25.72	2.0587	4 50 29.1	11.962	10	13 43 11.87	2.2040	5 12 39.6	12.756
11	12 3 29.29	2.0604	4 38 30.2	12.002	11	13 45 24.24	2.2083	5 25 24.6	12.743
12	12 5 32.97	2.0622	4 26 28.9	12.041	12	13 47 36.87	2.2127	5 38 8.8	12.730
13	12 7 36.75	2.0639	4 14 25.3	12.079	13	13 49 49.77	2.2173	5 50 52.2	12.715
14	12 9 40.64	2.0657	4 2 19.4	12.117	14	13 52 2.95	2.2220	6 3 34.6	12.697
15	12 11 44.64	2.0677	3 50 11.3	12.152	15	13 54 16.41	2.2266	6 16 15.9	12.680
16	12 13 48.76	2.0697	3 38 1.1	12.187	16	13 56 30.14	2.2312	6 28 56.2	12.662
17	12 15 53.00	2.0717	3 25 48.8	12.222	17	13 58 44.16	2.2360	6 41 35.3	12.640
18	12 17 57.36	2.0737	3 13 34.4	12.257	18	14 0 58.46	2.2408	6 54 13.0	12.618
19	12 20 1.84	2.0758	3 1 18.0	12.290	19	14 3 13.06	2.2457	7 6 49.4	12.594
20	12 22 6.46	2.0780	2 48 59.6	12.322	20	14 5 27.94	2.2505	7 19 24.3	12.569
21	12 24 11.20	2.0802	2 36 39.4	12.352	21	14 7 43.12	2.2554	7 31 57.7	12.542
22	12 26 16.08	2.0825	2 24 17.4	12.382	22	14 9 58.59	2.2604	7 44 29.4	12.514
23	12 28 21.10	2.0849	2 11 53.6	12.412	23	14 12 14.37	2.2655	7 56 59.4	12.484
24	12 30 26.27	2.0873	N. 1 59 28.0	12.440	24	14 14 30.45	2.2705	S. 8 9 27.5	12.452

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 25.					MONDAY 27.				
0	14 14 30.45	2.2705	S. 8 9 27.5	12.452	0	16 9 51.40	2.5383	S. 16 59 49.6	8.991
1	14 16 46.83	2.2756	8 21 53.7	12.420	1	16 12 23.86	2.5437	17 8 45.7	8.977
2	14 19 3.52	2.2807	8 34 17.9	12.385	2	16 14 56.64	2.5489	17 17 34.8	8.961
3	14 21 20.52	2.2859	8 46 39.9	12.348	3	16 17 29.73	2.5542	17 26 17.0	8.945
4	14 23 37.83	2.2912	8 58 59.7	12.311	4	16 20 3.14	2.5593	17 34 52.2	8.927
5	14 25 55.46	2.2965	9 11 17.2	12.272	5	16 22 36.85	2.5643	17 43 20.2	8.906
6	14 28 13.41	2.3018	9 23 32.4	12.232	6	16 25 10.86	2.5694	17 51 40.9	8.884
7	14 30 31.68	2.3072	9 35 45.1	12.190	7	16 27 45.18	2.5744	17 59 54.3	8.861
8	14 32 50.27	2.3125	9 47 55.2	12.145	8	16 30 19.79	2.5793	18 8 0.2	8.836
9	14 35 9.18	2.3179	10 0 2.5	12.099	9	16 32 54.70	2.5842	18 15 58.6	7.810
10	14 37 28.42	2.3233	10 12 7.1	12.053	10	16 35 29.89	2.5889	18 23 49.4	7.782
11	14 39 47.98	2.3288	10 24 8.9	12.004	11	16 38 5.37	2.5936	18 31 32.5	7.753
12	14 42 7.88	2.3344	10 36 7.6	11.953	12	16 40 41.12	2.5982	18 39 7.8	7.722
13	14 44 28.11	2.3399	10 48 3.2	11.901	13	16 43 17.15	2.6028	18 46 35.2	7.690
14	14 46 48.67	2.3455	10 59 55.7	11.847	14	16 45 53.46	2.6073	18 53 54.6	7.657
15	14 49 9.57	2.3511	11 11 44.9	11.792	15	16 48 30.03	2.6117	19 1 6.0	7.622
16	14 51 30.80	2.3567	11 23 30.7	11.734	16	16 51 6.86	2.6159	19 8 9.3	6.986
17	14 53 52.37	2.3623	11 35 13.0	11.675	17	16 53 43.94	2.6201	19 15 4.3	6.847
18	14 56 14.28	2.3680	11 46 51.7	11.614	18	16 56 21.27	2.6242	19 21 51.0	6.709
19	14 58 36.53	2.3737	11 58 26.7	11.552	19	16 58 58.84	2.6282	19 28 29.4	6.569
20	15 0 59.12	2.3794	12 9 57.9	11.487	20	17 1 36.65	2.6321	19 34 59.3	6.427
21	15 3 22.06	2.3852	12 21 25.2	11.422	21	17 4 14.69	2.6359	19 41 20.7	6.285
22	15 5 45.34	2.3908	12 32 48.6	11.355	22	17 6 52.96	2.6397	19 47 33.5	6.142
23	15 8 8.96	2.3966	S. 12 44 7.8	11.285	23	17 9 31.45	2.6432	S. 19 53 37.7	5.997
SUNDAY 26.					TUESDAY 28.				
0	15 10 32.93	2.4023	S. 12 55 22.8	11.214	0	17 12 10.15	2.6467	S. 19 59 33.1	5.850
1	15 12 57.24	2.4081	13 6 33.5	11.142	1	17 14 49.06	2.6502	20 5 19.7	5.703
2	15 15 21.90	2.4139	13 17 39.8	11.067	2	17 17 28.17	2.6534	20 10 57.5	5.555
3	15 17 46.91	2.4197	13 28 41.6	10.991	3	17 20 7.47	2.6566	20 16 26.3	5.406
4	15 20 12.26	2.4254	13 39 38.7	10.912	4	17 22 46.96	2.6597	20 21 46.2	5.256
5	15 22 37.96	2.4312	13 50 31.1	10.833	5	17 25 26.63	2.6626	20 26 57.0	5.104
6	15 25 4.01	2.4370	14 1 18.7	10.752	6	17 28 6.47	2.6653	20 31 58.7	4.952
7	15 27 30.40	2.4427	14 12 1.3	10.668	7	17 30 46.47	2.6680	20 36 51.2	4.798
8	15 29 57.14	2.4486	14 22 38.9	10.583	8	17 33 26.63	2.6706	20 41 34.5	4.645
9	15 32 24.23	2.4543	14 33 11.3	10.497	9	17 36 6.94	2.6731	20 46 8.6	4.490
10	15 34 51.66	2.4601	14 43 38.5	10.408	10	17 38 47.40	2.6754	20 50 33.3	4.334
11	15 37 19.44	2.4658	14 54 0.3	10.318	11	17 41 27.99	2.6775	20 54 48.7	4.178
12	15 39 47.56	2.4715	15 4 16.7	10.227	12	17 44 8.70	2.6795	20 58 54.7	4.022
13	15 42 16.02	2.4772	15 14 27.5	10.133	13	17 46 49.53	2.6815	21 2 51.3	3.863
14	15 44 44.83	2.4830	15 24 32.7	10.038	14	17 49 30.48	2.6833	21 6 38.3	3.704
15	15 47 13.98	2.4887	15 34 32.1	9.941	15	17 52 11.53	2.6849	21 10 15.8	3.546
16	15 49 43.47	2.4943	15 44 25.6	9.842	16	17 54 52.67	2.6863	21 13 43.8	3.387
17	15 52 13.30	2.4999	15 54 13.1	9.741	17	17 57 33.89	2.6877	21 17 2.2	3.227
18	15 54 43.46	2.5055	16 3 54.5	9.638	18	18 0 15.20	2.6891	21 20 11.0	3.066
19	15 57 13.96	2.5111	16 13 29.7	9.535	19	18 2 56.58	2.6901	21 23 10.1	2.904
20	15 59 44.79	2.5166	16 22 58.7	9.430	20	18 5 38.01	2.6910	21 25 59.5	2.743
21	16 2 15.95	2.5221	16 32 21.3	9.322	21	18 8 19.50	2.6919	21 28 39.3	2.582
22	16 4 47.44	2.5276	16 41 37.3	9.212	22	18 11 1.04	2.6926	21 31 9.3	2.418
23	16 7 19.26	2.5330	16 50 46.8	9.102	23	18 13 42.61	2.6931	21 33 29.5	2.256
24	16 9 51.40	2.5383	S. 16 59 49.6	8.991	24	18 16 24.21	2.6935	S. 21 35 40.0	2.093

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.																				
WEDNESDAY 29.					FRIDAY 31.																								
0	h m s		° ' "	"	0	h m s		° ' "	"																				
0	18 16 24.21	2.6935	S. 21 35 40.0	2.093	0	20 23 29.91	2.5552	S. 20 12 41.1	5.304																				
1	18 19 5.83	2.6937	21 37 40.7	1.930	1	20 26 3.06	2.5497	20 7 18.9	5.437																				
2	18 21 47.45	2.6937	21 39 31.6	1.767	2	20 28 35.88	2.5448	20 1 48.7	5.568																				
3	18 24 29.08	2.6937	21 41 12.8	1.604	3	20 31 8.37	2.5387	19 56 10.7	5.697																				
4	18 27 10.70	2.6935	21 42 44.1	1.440	4	20 33 40.52	2.5330	19 50 25.0	5.826																				
5	18 29 52.30	2.6932	21 44 5.6	1.276	5	20 36 12.33	2.5272	19 44 31.6	5.953																				
6	18 32 33.88	2.6927	21 45 17.2	1.112	6	20 38 43.79	2.5215	19 38 30.6	6.079																				
7	18 35 15.43	2.6921	21 46 19.1	0.950	7	20 41 14.91	2.5157	19 32 22.1	6.203																				
8	18 37 56.93	2.6912	21 47 11.2	0.786	8	20 43 45.68	2.5098	19 26 6.2	6.327																				
9	18 40 38.38	2.6903	21 47 53.4	0.622	9	20 46 16.09	2.5038	19 19 42.9	6.449																				
10	18 43 19.77	2.6892	21 48 25.9	0.460	10	20 48 46.14	2.4979	19 13 12.3	6.570																				
11	18 46 1.09	2.6881	21 48 48.6	0.297	11	20 51 15.84	2.4919	19 6 34.5	6.689																				
12	18 48 42.34	2.6867	21 49 1.5	-0.133	12	20 53 45.17	2.4858	18 59 49.6	6.807																				
13	18 51 23.50	2.6852	21 49 4.6	+0.030	13	20 56 14.14	2.4797	18 52 57.7	6.922																				
14	18 54 4.57	2.6836	21 48 57.9	0.192	14	20 58 42.74	2.4737	18 45 58.9	7.037																				
15	18 56 45.53	2.6817	21 48 41.5	0.353	15	21 1 10.98	2.4676	18 38 53.2	7.151																				
16	18 59 26.38	2.6798	21 48 15.5	0.515	16	21 3 38.85	2.4613	18 31 40.8	7.263																				
17	19 2 7.11	2.6778	21 47 39.7	0.677	17	21 6 6.34	2.4552	18 24 21.7	7.373																				
18	19 4 47.72	2.6757	21 46 54.2	0.838	18	21 8 33.47	2.4490	18 16 56.0	7.483																				
19	19 7 28.19	2.6733	21 45 59.1	0.998	19	21 11 0.22	2.4427	18 9 23.8	7.591																				
20	19 10 8.52	2.6707	21 44 54.4	1.158	20	21 13 26.59	2.4364	18 1 45.1	7.697																				
21	19 12 48.69	2.6682	21 43 40.1	1.317	21	21 15 52.59	2.4302	17 54 0.1	7.802																				
22	19 15 28.71	2.6656	21 42 16.3	1.476	22	21 18 18.21	2.4239	17 46 8.9	7.905																				
23	19 18 8.56	2.6627	S. 21 40 43.0	1.634	23	21 20 43.46	2.4176	S. 17 38 11.5	8.007																				
THURSDAY 30.					SATURDAY, JUNE 1.																								
0	19 20 48.23	2.6597	S. 21 39 0.2	1.792	0	21 23 8.32	2.4112	S. 17 30 8.0	8.108																				
1	19 23 27.72	2.6566	21 37 8.0	1.948	PHASES OF THE MOON.																								
2	19 26 7.02	2.6533	21 35 6.4	2.105																									
3	19 28 46.12	2.6500	21 32 55.4	2.261																									
4	19 31 25.02	2.6466	21 30 35.1	2.415																									
5	19 34 3.71	2.6430	21 28 5.6	2.568	<table><tr><td></td><td>d</td><td>h</td><td>m</td></tr><tr><td>☾ Last Quarter . . . . .</td><td>May</td><td>4</td><td>9 53.5</td></tr><tr><td>● New Moon . . . . .</td><td></td><td>11</td><td>20 59.3</td></tr><tr><td>☾ First Quarter . . . . .</td><td></td><td>20</td><td>1 27.5</td></tr><tr><td>○ Full Moon . . . . .</td><td></td><td>27</td><td>2 17.8</td></tr></table>						d	h	m	☾ Last Quarter . . . . .	May	4	9 53.5	● New Moon . . . . .		11	20 59.3	☾ First Quarter . . . . .		20	1 27.5	○ Full Moon . . . . .		27	2 17.8
	d	h	m																										
☾ Last Quarter . . . . .	May	4	9 53.5																										
● New Moon . . . . .		11	20 59.3																										
☾ First Quarter . . . . .		20	1 27.5																										
○ Full Moon . . . . .		27	2 17.8																										
6	19 36 42.18	2.6392	21 25 26.9	2.722																									
7	19 39 20.42	2.6354	21 22 39.0	2.874																									
8	19 41 58.43	2.6315	21 19 42.0	3.025																									
9	19 44 36.20	2.6274	21 16 36.0	3.175	<table><tr><td></td><td>d</td><td>h</td></tr><tr><td>☾ Apogee . . . . .</td><td>May</td><td>15 21.2</td></tr><tr><td>☾ Perigee . . . . .</td><td></td><td>28 5.3</td></tr></table>						d	h	☾ Apogee . . . . .	May	15 21.2	☾ Perigee . . . . .		28 5.3											
	d	h																											
☾ Apogee . . . . .	May	15 21.2																											
☾ Perigee . . . . .		28 5.3																											
10	19 47 13.72	2.6233	21 13 21.0	3.325																									
11	19 49 50.99	2.6191	21 9 57.0	3.473																									
12	19 52 28.01	2.6147	21 6 24.2	3.621																									
13	19 55 4.76	2.6102	21 2 42.5	3.767																									
14	19 57 41.23	2.6056	20 58 52.1	3.912																									
15	20 0 17.43	2.6010	20 54 53.0	4.057																									
16	20 2 53.35	2.5962	20 50 45.3	4.200																									
17	20 5 28.98	2.5914	20 46 29.0	4.342																									
18	20 8 4.32	2.5865	20 42 4.2	4.483																									
19	20 10 39.36	2.5814	20 37 31.0	4.623																									
20	20 13 14.09	2.5763	20 32 49.4	4.762																									
21	20 15 48.52	2.5712	20 27 59.6	4.898																									
22	20 18 22.64	2.5659	20 23 1.6	5.035																									
23	20 20 56.43	2.5606	20 17 55.4	5.171																									
24	20 23 29.91	2.5552	S. 20 12 41.1	5.304																									

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Spica W.	62 8 12	2180	63 57 9	2184	65 46 1	2188	67 34 47	2192
	Fomalhaut E.	70 36 55	2390	68 53 6	2402	67 9 34	2414	65 26 19	2428
	α Pegasi E.	86 54 27	2518	85 13 38	2525	83 33 0	2533	81 52 33	2542
	SATURN E.	89 19 4	2171	87 29 53	2176	85 40 49	2181	83 51 53	2186
	SUN E.	135 22 9	2468	133 40 11	2472	131 58 18	2476	130 16 31	2481
2	Spica W.	76 36 33	2224	78 24 25	2232	80 12 5	2239	81 59 34	2247
	Antares W.	31 11 25	2355	32 56 4	2349	34 40 53	2344	36 25 49	2341
	Fomalhaut E.	56 55 34	2517	55 14 44	2539	53 34 25	2564	51 54 40	2591
	α Pegasi E.	73 34 3	2607	71 55 18	2624	70 16 55	2642	68 38 57	2661
	SATURN E.	74 49 35	2223	73 1 41	2230	71 13 58	2238	69 26 27	2247
	SUN E.	121 49 33	2512	120 8 37	2521	118 27 53	2528	116 47 19	2536
3	Spica W.	90 53 48	2293	92 39 58	2303	94 25 53	2313	96 11 34	2323
	Antares W.	45 10 45	2348	46 55 34	2354	48 40 15	2359	50 24 49	2365
	Fomalhaut E.	43 46 9	2764	42 10 54	2811	40 36 40	2861	39 3 31	2916
	SATURN E.	60 32 13	2294	58 46 4	2304	57 0 10	2314	55 14 30	2324
	α Pegasi E.	60 36 18	2782	59 1 26	2812	57 27 14	2844	55 53 43	2878
	SUN E.	108 27 34	2584	106 48 17	2594	105 9 14	2604	103 30 24	2615
4	Spica W.	104 56 8	2378	106 40 15	2389	108 24 6	2400	110 7 41	2412
	Antares W.	59 5 12	2403	60 48 43	2411	62 32 2	2420	64 15 8	2429
	MARS W.	24 8 29	2462	25 50 36	2470	27 32 31	2479	29 14 13	2488
	SATURN E.	46 30 2	2378	44 45 56	2389	43 2 5	2400	41 18 30	2411
	α Pegasi E.	48 18 15	2906	46 50 0	3151	45 22 52	3211	43 56 56	3272
	SUN E.	95 19 56	2669	93 42 35	2681	92 5 30	2692	90 28 39	2704
5	Antares W.	72 47 23	2477	74 29 9	2487	76 10 41	2496	77 52 0	2506
	MARS W.	37 39 30	2537	39 19 52	2546	41 0 1	2556	42 39 56	2566
	α Aquilæ W.	37 16 12	4692	38 17 18	4532	39 20 42	4390	40 26 12	4265
	SATURN E.	32 44 40	2470	31 2 44	2482	29 21 4	2494	27 39 42	2506
	SUN E.	82 28 15	2761	80 52 56	2773	79 17 53	2784	77 43 4	2796
6	Antares W.	86 15 3	2557	87 54 57	2567	89 34 38	2577	91 14 4	2587
	MARS W.	50 56 4	2617	52 34 36	2627	54 12 55	2637	55 51 0	2646
	α Aquilæ W.	46 18 53	3831	47 33 23	3771	48 48 55	3718	50 5 23	3671
	SUN E.	69 52 47	2853	68 19 28	2865	66 46 24	2876	65 13 34	2887
7	Antares W.	99 27 47	2639	101 5 49	2649	102 43 38	2659	104 21 13	2669
	MARS W.	63 58 9	2695	65 34 56	2705	67 11 29	2714	68 47 50	2723
	α Aquilæ W.	56 38 35	3505	57 58 54	3482	59 19 38	3462	60 40 45	3444
	SUN E.	57 33 1	2943	56 1 37	2954	54 30 28	2965	52 59 32	2977
8	MARS W.	76 46 35	2769	78 21 43	2778	79 56 40	2787	81 31 25	2796
	α Aquilæ W.	67 30 30	3387	68 53 1	3381	70 15 39	3375	71 38 24	3371
	SUN E.	45 28 21	3033	43 58 49	3044	42 29 31	3056	41 0 28	3067
9	MARS W.	89 22 21	2839	90 55 58	2847	92 29 25	2855	94 2 41	2864
	α Aquilæ W.	78 32 48	3369	79 55 40	3372	81 18 29	3375	82 41 14	3379
	SUN E.	33 38 45	3129	32 11 10	3142	30 43 51	3156	29 16 49	3170
14	SUN W.	23 53 22	3476	25 14 13	3473	26 35 7	3472	27 56 2	3471



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
1.	Spica W.	69 23 26	2198	71 11 56	2204	73 0 18	2210	74 48 30	2216
	Fomalhaut E.	63 43 24	2443	62 0 50	2459	60 18 39	2477	58 36 53	2496
	α Pegasi E.	80 12 18	2553	78 32 18	2565	76 52 35	2578	75 13 9	2592
	SATURN E.	82 3 5	2193	80 14 27	2200	78 25 59	2207	76 37 41	2214
	SUN E.	128 34 51	2487	126 53 19	2492	125 11 55	2498	123 30 39	2505
2	Spica W.	83 46 51	2256	85 33 55	2265	87 20 46	2274	89 7 24	2283
	Antares W.	38 10 49	2340	39 55 50	2341	41 40 51	2342	43 25 50	2344
	Fomalhaut E.	50 15 32	2680	48 37 3	2652	46 59 18	2686	45 22 19	2723
	α Pegasi E.	67 1 25	2682	65 24 21	2704	63 47 47	2729	62 11 46	2755
	SATURN E.	67 39 9	2256	65 52 5	2265	64 5 14	2274	62 18 37	2284
	SUN E.	115 6 56	2545	113 26 46	2555	111 46 49	2564	110 7 5	2574
3	Spica W.	97 57 0	2334	99 42 10	2344	101 27 5	2355	103 11 44	2366
	Antares W.	52 9 14	2372	53 53 29	2379	55 37 34	2386	57 21 29	2394
	Fomalhaut E.	37 31 33	2980	36 0 55	3052	34 31 46	3132	33 4 16	3220
	SATURN E.	53 29 6	2335	51 43 57	2345	49 59 3	2355	48 14 25	2366
	α Pegasi E.	54 20 56	2915	52 48 56	2955	51 17 47	2998	49 47 32	3045
	SUN E.	101 51 49	2626	100 13 29	2636	98 35 23	2647	96 57 32	2658
4	Spica W.	111 50 59	2424	113 34 0	2435	115 16 45	2446	116 59 14	2458
	Antares W.	65 58 2	2438	67 40 42	2448	69 23 9	2457	71 5 23	2467
	MARS W.	30 55 43	2497	32 37 0	2507	34 18 3	2517	35 58 53	2527
	SATURN E.	39 35 11	2423	37 52 9	2434	36 9 23	2446	34 26 53	2458
	α Pegasi E.	42 32 18	3351	41 9 5	3431	39 47 23	3520	38 27 21	3623
	SUN E.	88 52 4	2715	87 15 44	2726	85 39 39	2738	84 3 49	2750
5	Antares W.	79 33 5	2516	81 13 56	2527	82 54 32	2537	84 34 54	2547
	MARS W.	44 19 38	2577	45 59 5	2587	47 38 18	2597	49 17 18	2607
	α Aquilæ W.	41 33 37	4156	42 42 45	4060	43 53 26	3974	45 5 31	3898
	SATURN E.	25 58 37	2520	24 17 51	2533	22 37 24	2546	20 57 15	2559
	SUN E.	76 8 31	2807	74 34 12	2819	73 0 9	2831	71 26 21	2842
6	Antares W.	92 53 17	2597	94 32 16	2608	96 11 0	2618	97 49 30	2628
	MARS W.	57 28 52	2656	59 6 31	2666	60 43 56	2675	62 21 9	2685
	α Aquilæ W.	51 22 41	3630	52 40 43	3593	53 59 25	3559	55 18 44	3530
	SUN E.	63 40 59	2898	62 8 38	2909	60 36 32	2920	59 4 39	2932
7	Antares W.	105 58 35	2679	107 35 42	2689	109 12 36	2700	110 49 16	2710
	MARS W.	70 24 0	2732	71 59 57	2741	73 35 41	2750	75 11 14	2760
	α Aquilæ W.	62 2 13	3429	63 23 57	3416	64 45 55	3404	66 8 7	3394
	SUN E.	51 28 50	2988	49 58 22	2999	48 28 8	3010	46 58 8	3021
8	MARS W.	83 5 59	2805	84 40 21	2813	86 14 32	2821	87 48 32	2830
	α Aquilæ W.	73 1 14	3369	74 24 6	3368	75 46 59	3367	77 9 53	3367
	SUN E.	39 31 38	3078	38 3 2	3091	36 34 42	3103	35 6 36	3115
9	MARS W.	95 35 46	2873	97 8 40	2880	98 41 24	2888	100 13 57	2896
	α Aquilæ W.	84 3 55	3384	85 26 30	3390	86 48 58	3397	88 11 19	3404
	SUN E.	27 50 4	3186	26 23 38	3203	24 57 32	3220	23 31 46	3238
14	SUN W.	29 16 59	3471	30 37 56	3471	31 58 53	3470	33 19 51	3471

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
14	Regulus E.	72 22 18	3032	70 52 45	3037	69 23 18	3042	67 53 57	3046
15	SUN W.	34 40 48	3471	36 1 44	3471	37 22 39	3471	38 43 35	3472
	Regulus E.	60 28 29	3065	58 59 37	3068	57 30 49	3071	56 2 4	3074
	Spica E.	114 18 33	3101	112 50 24	3103	111 22 18	3105	109 54 14	3106
16	SUN W.	45 28 7	3472	46 49 2	3472	48 9 57	3471	49 30 54	3469
	Regulus E.	48 39 1	3082	47 10 30	3083	45 42 0	3084	44 13 30	3084
	Spica E.	102 34 20	3111	101 6 24	3111	99 38 28	3111	98 10 32	3110
17	SUN W.	56 16 8	3458	57 37 19	3454	58 58 34	3450	60 19 53	3446
	Regulus E.	36 50 59	3080	35 22 25	3078	33 53 49	3076	32 25 10	3074
	Spica E.	90 50 34	3103	89 22 28	3101	87 54 20	3098	86 26 8	3095
18	SUN W.	67 7 49	3419	68 29 43	3413	69 51 45	3405	71 13 56	3398
	JUPITER W.	23 28 2	3117	24 55 51	3110	26 23 49	3103	27 51 55	3095
	Regulus E.	25 1 10	3060	23 32 12	3057	22 3 10	3054	20 34 3	3051
	Spica E.	79 4 0	3073	77 35 18	3068	76 6 29	3062	74 37 33	3056
	Antares E.	124 53 44	3104	123 25 39	3096	121 57 25	3088	120 29 1	3079
19	SUN W.	78 7 9	3353	79 30 19	3342	80 53 42	3331	82 17 17	3319
	JUPITER W.	35 14 53	3052	36 44 1	3042	38 13 21	3032	39 42 54	3022
	Spica E.	67 10 48	3019	65 40 59	3010	64 10 59	3002	62 40 49	2993
	Antares E.	113 4 13	3032	111 34 40	3021	110 4 53	3010	108 34 53	2999
20	SUN W.	89 18 41	3257	90 43 43	3243	92 9 1	3228	93 34 37	3213
	JUPITER W.	47 14 5	2962	48 45 5	2949	50 16 21	2936	51 47 54	2922
	Pollux W.	35 46 41	2983	37 17 15	2964	38 48 14	2945	40 19 36	2926
	Spica E.	55 6 59	2943	53 35 35	2932	52 3 57	2922	50 32 6	2911
	Antares E.	101 1 15	2938	99 29 45	2925	97 57 58	2912	96 25 54	2898
21	SUN W.	100 47 6	3134	102 14 34	3118	103 42 22	3100	105 10 32	3082
	JUPITER W.	59 30 14	2848	61 3 40	2832	62 37 27	2815	64 11 35	2799
	Pollux W.	48 2 17	2835	49 35 59	2817	51 10 5	2798	52 44 35	2779
	Spica E.	42 49 18	2855	41 16 2	2845	39 42 32	2835	38 8 48	2825
	Antares E.	88 41 0	2824	87 7 3	2808	85 32 46	2792	83 58 8	2776
22	SUN W.	112 36 49	2991	114 7 13	2972	115 38 1	2953	117 9 13	2934
	JUPITER W.	72 7 47	2712	73 44 11	2694	75 20 59	2676	76 58 11	2657
	Pollux W.	60 43 12	2686	62 20 10	2667	63 57 34	2648	65 35 24	2629
	Regulus W.	24 39 53	2665	26 17 20	2646	27 55 13	2626	29 33 33	2606
	Antares E.	75 59 39	2694	74 22 51	2677	72 45 40	2660	71 8 6	2643
	MARS E.	114 55 56	2706	113 19 24	2688	111 42 28	2669	110 5 6	2650
23	JUPITER W.	85 10 27	2564	86 50 11	2545	88 30 21	2527	90 10 57	2508
	Pollux W.	73 51 1	2534	75 31 27	2515	77 12 20	2496	78 53 40	2477
	Regulus W.	37 51 54	2509	39 32 55	2490	41 14 22	2471	42 56 17	2452
	Antares E.	62 54 28	2557	61 14 34	2541	59 34 18	2523	57 53 39	2509
	MARS E.	101 51 52	2554	100 11 54	2535	98 31 30	2516	96 50 39	2497
	$\alpha$ Aquilæ E.	108 24 27	3183	106 57 58	3153	105 30 52	3123	104 3 10	3094
24	JUPITER W.	98 40 28	2415	100 23 41	2398	102 7 19	2380	103 51 22	2362

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
14	Regulus E.	66 24 41	3051	64 55 31	3055	63 26 26	3058	61 57 25	3062
15	SUN W.	40 4 30	3473	41 25 24	3473	42 46 18	3473	44 7 12	3478
	Regulus E.	54 33 23	3076	53 4 44	3078	51 36 8	3080	50 7 34	3081
	Spica E.	108 26 12	3108	106 58 12	3109	105 30 14	3110	104 2 17	3110
16	SUN W.	50 51 53	3468	52 12 53	3466	53 33 55	3463	54 55 0	3461
	Regulus E.	42 45 1	3084	41 16 32	3083	39 48 2	3082	38 19 31	3081
	Spica E.	96 42 35	3110	95 14 37	3109	93 46 38	3107	92 18 37	3105
17	SUN W.	61 41 17	3442	63 2 46	3437	64 24 20	3431	65 46 1	3425
	Regulus E.	30 56 29	3071	29 27 44	3069	27 58 56	3066	26 30 5	3063
	Spica E.	84 57 52	3091	83 29 31	3087	82 1 6	3083	80 32 36	3078
18	SUN W.	72 36 15	3390	73 58 43	3381	75 21 21	3372	76 44 10	3363
	JUPITER W.	29 20 11	3087	30 48 36	3079	32 17 11	3070	33 45 57	3061
	Regulus E.	19 4 53	3049	17 35 41	3050	16 6 29	3051	14 37 19	3052
	Spica E.	73 8 29	3049	71 39 17	3042	70 9 57	3034	68 40 27	3027
	Antares E.	119 0 26	3070	117 31 40	3061	116 2 43	3052	114 33 34	3042
19	SUN W.	83 41 6	3308	85 5 8	3296	86 29 24	3283	87 53 55	3270
	JUPITER W.	41 12 40	3011	42 42 39	2999	44 12 53	2987	45 43 21	2975
	Spica E.	61 10 27	2983	59 39 54	2973	58 9 8	2964	56 38 10	2954
	Antares E.	107 4 39	2988	105 34 11	2976	104 3 28	2963	102 32 29	2951
20	SUN W.	95 0 30	3198	96 26 41	3183	97 53 10	3167	99 19 58	3151
	JUPITER W.	53 19 45	2908	54 51 54	2893	56 24 21	2878	57 57 8	2863
	Pollux W.	41 51 22	2908	43 23 31	2890	44 56 3	2872	46 28 58	2853
	Spica E.	49 0 1	2900	47 27 42	2888	45 55 8	2877	44 22 20	2866
	Antares E.	94 53 32	2883	93 20 52	2869	91 47 54	2854	90 14 37	2839
21	SUN W.	106 39 3	3065	108 7 56	3047	109 37 11	3028	111 6 49	3010
	JUPITER W.	65 46 4	2782	67 20 56	2765	68 56 10	2748	70 31 47	2730
	Pollux W.	54 19 30	2761	55 54 48	2743	57 30 31	2724	59 6 39	2705
	Spica E.	36 34 52	2816	35 0 44	2807	33 26 25	2800	31 51 56	2794
	Antares E.	82 23 10	2760	80 47 50	2744	79 12 8	2727	77 36 5	2710
22	SUN W.	118 40 49	2915	120 12 49	2895	121 45 14	2875	123 18 4	2855
	JUPITER W.	78 35 48	2639	80 13 50	2621	81 52 17	2602	83 31 9	2583
	Pollux W.	67 13 39	2610	68 52 20	2591	70 31 27	2572	72 11 1	2553
	Regulus W.	31 12 20	2587	32 51 33	2567	34 31 13	2548	36 11 20	2528
	Antares E.	69 30 9	2626	67 51 48	2609	66 13 5	2591	64 33 58	2574
	MARS E.	108 27 19	2631	106 49 6	2612	105 10 28	2593	103 31 23	2574
23	JUPITER W.	91 51 59	2489	93 33 27	2471	95 15 21	2452	96 57 41	2433
	Pollux W.	80 35 26	2458	82 17 39	2439	84 0 18	2421	85 43 23	2403
	Regulus W.	44 38 38	2433	46 21 26	2414	48 4 41	2396	49 48 22	2377
	Antares E.	56 12 38	2492	54 31 14	2477	52 49 28	2462	51 7 22	2448
	MARS E.	95 9 22	2478	93 27 38	2459	91 45 27	2441	90 2 50	2422
	α Aquilæ E.	102 34 53	3067	101 6 3	3042	99 36 42	3017	98 6 50	2993
24	JUPITER W.	105 35 51	2345	107 20 45	2328	109 6 3	2312	110 51 45	2296

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
24	Pollux W.	87 26 54	2384	89 10 51	2366	90 55 14	2349	92 40 2	2332
	Regulus W.	51 32 30	2359	53 17 4	2341	55 2 5	2323	56 47 31	2305
	Antares E.	49 24 55	2434	47 42 8	2421	45 59 3	2409	44 15 40	2397
	MARS E.	88 19 46	2403	86 36 16	2384	84 52 19	2366	83 7 56	2349
	α Aquilæ E.	96 36 29	2971	95 5 40	2950	93 34 25	2930	92 2 44	2912
25	JUPITER W.	112 37 51	2280	114 24 21	2264	116 11 13	2249	117 58 28	2235
	Pollux W.	101 30 10	2251	103 17 22	2237	105 4 55	2222	106 52 50	2208
	Regulus W.	65 40 59	2223	67 28 53	2207	69 17 10	2192	71 5 49	2178
	MARS E.	74 19 43	2265	72 32 51	2249	70 45 37	2234	68 58 0	2219
	α Aquilæ E.	84 18 59	2839	82 45 21	2829	81 11 30	2820	79 37 28	2813
26	Regulus W.	80 14 19	2113	82 4 58	2102	83 55 55	2091	85 47 8	2081
	Spica W.	27 3 24	2268	28 50 11	2240	30 37 39	2215	32 25 44	2192
	MARS E.	59 54 38	2154	58 5 0	2143	56 15 6	2132	54 24 55	2122
	α Aquilæ E.	71 45 50	2808	70 11 31	2813	68 37 19	2820	67 3 17	2831
	Fomalhaut E.	104 30 58	2338	102 45 54	2324	101 0 30	2311	99 14 46	2298
	α Pegasi E.	119 22 35	2619	117 44 6	2591	116 4 59	2566	114 25 17	2542
27	Regulus W.	95 6 43	2041	96 59 13	2035	98 51 52	2030	100 44 39	2026
	Spica W.	41 33 28	2113	43 24 8	2102	45 15 4	2092	47 6 15	2084
	MARS E.	45 10 34	2083	43 19 9	2078	41 27 35	2074	39 35 54	2070
	α Aquilæ E.	59 17 52	2933	57 46 15	2965	56 15 18	3002	54 45 8	3044
	Fomalhaut E.	90 22 5	2253	88 34 56	2247	86 47 39	2240	85 0 15	2240
	α Pegasi E.	105 59 25	2452	104 17 4	2438	102 34 24	2427	100 51 28	2419
28	Regulus W.	110 9 55	2015	112 3 6	2015	113 56 17	2016	115 49 27	2017
	Spica W.	56 24 48	2059	58 16 51	2057	60 8 57	2056	62 1 4	2055
	Fomalhaut E.	76 2 41	2241	74 15 15	2246	72 27 56	2251	70 40 45	2258
	α Pegasi E.	92 14 16	2395	90 30 34	2394	88 46 50	2395	87 3 8	2398
	SATURN E.	97 19 43	2033	95 27 1	2033	93 34 19	2034	91 41 38	2035
29	Spica W.	71 21 20	2067	73 13 10	2072	75 4 52	2077	76 56 26	2083
	Antares W.	26 6 35	2257	27 53 38	2236	29 41 11	2220	31 29 8	2208
	Fomalhaut E.	61 48 5	2316	60 2 28	2332	58 17 15	2350	56 32 29	2371
	α Pegasi E.	78 26 21	2434	76 43 35	2445	75 1 5	2459	73 18 54	2475
	SATURN E.	82 19 5	2053	80 26 53	2058	78 34 49	2064	76 42 54	2070
	α Arietis E.	121 36 35	2235	119 49 0	2234	118 1 23	2233	116 13 44	2233
30	Spica W.	86 11 34	2124	88 1 56	2134	89 52 3	2145	91 41 55	2156
	Antares W.	40 31 39	2194	42 20 15	2197	44 8 47	2201	45 57 13	2207
	Fomalhaut E.	47 57 1	2509	46 16 0	2546	44 35 51	2586	42 56 37	2631
	α Pegasi E.	64 54 5	2576	63 14 37	2602	61 35 44	2631	59 57 31	2662
	SATURN E.	67 26 14	2113	65 35 35	2124	63 45 12	2134	61 55 5	2145
	α Arietis E.	107 16 19	2254	105 29 12	2261	103 42 15	2269	101 55 29	2278
31	Spica W.	100 46 45	2218	102 34 46	2232	104 22 26	2246	106 9 46	2260
	Antares W.	54 56 49	2248	56 44 4	2259	58 31 4	2270	60 17 48	2281
	α Pegasi E.	51 57 54	2858	50 24 41	2908	48 52 32	2962	47 21 31	3021
	SATURN E.	52 48 57	2208	51 0 41	2221	49 12 45	2235	47 25 9	2249
	α Arietis E.	93 5 21	2333	91 20 10	2346	89 35 18	2360	87 50 45	2374
	SUN E.	125 30 13	2492	123 48 49	2506	122 7 44	2520	120 26 59	2534

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
24	Pollux	W.	94 25 15	2315	96 10 53	2298	97 56 55	2282	99 43 21	2266
	Regulus	W.	58 33 23	2298	60 19 40	2271	62 6 22	2255	63 53 28	2239
	Antares	E.	42 32 0	2387	40 48 6	2378	39 3 59	2370	37 19 41	2364
	MARS	E.	81 23 8	2331	79 37 54	2314	77 52 15	2297	76 6 11	2281
	α Aquilæ	E.	90 30 40	2294	88 58 14	2278	87 25 27	2264	85 52 21	2251
25	JUPITER	W.	119 46 4	2221	121 34 1	2207	123 22 18	2194	125 10 54	2182
	Pollux	W.	108 41 5	2195	110 29 40	2182	112 18 35	2170	114 7 47	2159
	Regulus	W.	72 54 50	2164	74 44 12	2150	76 33 55	2137	78 23 58	2125
	MARS	E.	67 10 0	2204	65 21 39	2191	63 32 58	2178	61 43 57	2166
	α Aquilæ	E.	78 3 17	2208	76 28 59	2204	74 54 36	2203	73 20 12	2205
26	Regulus	W.	87 38 36	2072	89 30 19	2063	91 22 15	2055	93 14 23	2048
	Spica	W.	34 14 23	2172	36 3 32	2155	37 53 8	2139	39 43 7	2125
	MARS	E.	52 34 29	2113	50 43 49	2104	48 52 55	2096	47 1 50	2089
	α Aquilæ	E.	65 29 29	2244	63 55 58	2261	62 22 49	2281	60 50 5	2295
	Fomalhaut	E.	97 28 43	2287	95 42 24	2277	93 55 51	2268	92 9 4	2260
	α Pegasi	E.	112 45 2	2520	111 4 17	2500	109 23 4	2482	107 41 26	2466
27	Regulus	W.	102 37 33	2022	104 30 33	2019	106 23 37	2017	108 16 45	2016
	Spica	W.	48 57 38	2077	50 49 13	2071	52 40 57	2066	54 32 49	2062
	MARS	E.	37 44 8	2068	35 52 18	2066	34 0 26	2065	32 8 33	2065
	α Aquilæ	E.	53 15 50	3092	51 47 31	3148	50 20 20	3210	48 54 23	3279
	Fomalhaut	E.	83 12 47	2238	81 25 15	2237	79 37 43	2237	77 50 11	2238
	α Pegasi	E.	99 8 20	2411	97 25 1	2404	95 41 32	2399	93 57 56	2396
28	Regulus	W.	117 42 35	2019	119 35 40	2022	121 28 39	2026	123 21 32	2030
	Spica	W.	63 53 12	2056	65 45 19	2058	67 37 23	2060	69 29 24	2063
	Fomalhaut	E.	68 53 44	2267	67 6 55	2277	65 20 21	2288	63 34 3	2301
	α Pegasi	E.	85 19 31	2403	83 36 0	2408	81 52 36	2415	80 9 22	2424
	SATURN	E.	89 48 59	2037	87 56 23	2040	86 3 51	2044	84 11 25	2048
29	Spica	W.	78 47 51	2090	80 39 5	2098	82 30 7	2106	84 20 57	2115
	Antares	W.	33 17 23	2200	35 5 50	2196	36 54 24	2194	38 43 1	2193
	Fomalhaut	E.	54 48 12	2394	53 4 28	2418	51 21 19	2445	49 38 49	2475
	α Pegasi	E.	71 37 5	2491	69 55 39	2509	68 14 38	2530	66 34 6	2552
	SATURN	E.	74 51 9	2078	72 59 36	2086	71 8 15	2094	69 17 7	2103
	α Arietis	E.	114 26 6	2235	112 38 31	2238	110 51 0	2242	109 3 36	2248
30	Spica	W.	93 31 29	2168	95 20 46	2180	97 9 44	2192	98 58 24	2205
	Antares	W.	47 45 31	2214	49 33 38	2221	51 21 34	2229	53 9 18	2238
	Fomalhaut	E.	41 18 24	2681	39 41 19	2738	38 5 29	2801	36 31 2	2870
	α Pegasi	E.	58 20 0	2695	56 43 13	2731	55 7 13	2770	53 32 6	2812
	SATURN	E.	60 5 15	2157	58 15 43	2169	56 26 29	2181	54 37 33	2194
	α Arietis	E.	100 8 57	2288	98 22 39	2298	96 36 37	2309	94 50 51	2320
31	Spica	W.	107 56 44	2275	109 43 20	2290	111 29 34	2306	113 15 25	2322
	Antares	W.	62 4 15	2294	63 50 24	2307	65 36 14	2320	67 21 46	2333
	α Pegasi	E.	45 51 43	3085	44 23 15	3155	42 56 12	3233	41 30 42	3319
	SATURN	E.	45 37 55	2264	43 51 3	2279	42 4 32	2294	40 18 23	2309
	α Arietis	E.	86 6 33	2389	84 22 42	2404	82 39 12	2420	80 56 5	2436
	SUN	E.	118 46 33	2549	117 6 28	2564	115 26 43	2579	113 47 19	259

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Equation of Time, to be Subtracted from	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Added to Apparent Time.	
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>s</sup>	<sup>m</sup> <sup>s</sup>	<sup>s</sup>
Sat.	1	4 32 42.90	10.215	N 21 56 4.1	+ 21.25	15 48.06	68.33	2 33.42	0.357
SUN.	2	4 36 48.27	10.233	22 4 22.7	20.29	15 47.91	68.39	2 24.63	0.375
Mon.	3	4 40 54.06	10.250	22 12 18.3	19.33	15 47.77	68.45	2 15.43	0.392
Tues.	4	4 45 0.25	10.266	22 19 50.8	+ 18.36	15 47.63	68.50	2 5.82	0.409
Wed.	5	4 49 6.84	10.282	22 27 0.0	17.39	15 47.50	68.55	1 55.82	0.424
Thur.	6	4 53 13.79	10.297	22 33 45.7	16.40	15 47.37	68.60	1 45.45	0.439
Frid.	7	4 57 21.08	10.312	22 40 7.6	+ 15.42	15 47.25	68.64	1 34.74	0.453
Sat.	8	5 1 28.70	10.324	22 46 5.8	14.42	15 47.13	68.68	1 23.71	0.466
SUN.	9	5 5 36.62	10.335	22 51 40.1	13.41	15 47.02	68.72	1 12.39	0.478
Mon.	10	5 9 44.81	10.345	22 56 50.4	+ 12.41	15 46.91	68.76	1 0.79	0.489
Tues.	11	5 13 53.25	10.355	23 1 36.3	11.40	15 46.81	68.79	0 48.94	0.499
Wed.	12	5 18 1.91	10.363	23 5 58.0	10.39	15 46.71	68.82	0 36.86	0.508
Thur.	13	5 22 10.79	10.371	23 9 55.3	+ 9.37	15 46.62	68.84	0 24.57	0.516
Frid.	14	5 26 19.83	10.378	23 13 28.1	8.36	15 46.53	68.87	0 12.11	0.522
Sat.	15	5 30 29.03	10.385	23 16 36.3	7.33	15 46.45	68.89	0 0.50	0.528
SUN.	16	5 34 38.35	10.390	23 19 19.8	+ 6.30	15 46.37	68.91	0 13.22	0.532
Mon.	17	5 38 47.77	10.393	23 21 38.6	5.27	15 46.30	68.92	0 26.04	0.536
Tues.	18	5 42 57.27	10.395	23 23 32.7	4.24	15 46.23	68.93	0 38.95	0.539
Wed.	19	5 47 6.82	10.396	23 25 2.0	+ 3.21	15 46.17	68.94	0 51.90	0.540
Thur.	20	5 51 16.39	10.397	23 26 6.4	2.16	15 46.11	68.95	1 4.88	0.541
Frid.	21	5 55 25.97	10.397	23 26 46.1	1.13	15 46.06	68.95	1 17.86	0.540
Sat.	22	5 59 35.52	10.396	23 27 0.9	+ 0.10	15 46.01	68.95	1 30.82	0.539
SUN.	23	6 3 45.02	10.394	23 26 50.9	- 0.93	15 45.96	68.94	1 43.74	0.537
Mon.	24	6 7 54.47	10.391	23 26 16.0	1.96	15 45.92	68.93	1 56.59	0.534
Tues.	25	6 12 3.83	10.388	23 25 16.4	- 2.99	15 45.88	68.92	2 9.35	0.530
Wed.	26	6 16 13.09	10.385	23 23 52.0	4.02	15 45.84	68.91	2 22.02	0.526
Thur.	27	6 20 22.25	10.380	23 22 3.1	5.05	15 45.80	68.89	2 34.59	0.521
Frid.	28	6 24 31.26	10.373	23 19 49.4	- 6.07	15 45.77	68.87	2 47.01	0.515
Sat.	29	6 28 40.12	10.366	23 17 11.1	7.09	15 45.74	68.84	2 59.28	0.508
SUN.	30	6 32 48.81	10.358	23 14 8.3	8.11	15 45.72	68.81	3 11.38	0.500
Mon.	31	6 36 57.31	10.349	N. 23 10 41.1	- 9.13	15 45.70	68.78	3 23.29	0.492

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.19 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to		Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Subtracted from Mean Time.			
Sat.	1	h m s 4 32 43.33	s 10.213	° ' " N.21 56 5.0	" + 21.25	m s 2 33.42	s 0.357	h m s 4 35 16.75	
SUN.	2	4 36 48.68	10.231	22 4 23.5	20.29	2 24.62	0.375	4 39 13.30	
Mon.	3	4 40 54.44	10.249	22 12 19.0	19.33	2 15.42	0.392	4 43 9.86	
Tues.	4	4 45 0.61	10.265	22 19 51.4	+ 18.36	2 5.81	0.409	4 47 6.42	
Wed.	5	4 49 7.17	10.281	22 27 0.5	17.39	1 55.81	0.424	4 51 2.98	
Thur.	6	4 53 14.09	10.295	22 33 46.1	16.41	1 45.44	0.439	4 54 59.53	
Frid.	7	4 57 21.35	10.309	22 40 8.0	+ 15.42	1 34.74	0.453	4 58 56.09	
Sat.	8	5 1 28.94	10.322	22 46 6.1	14.42	1 23.70	0.466	5 2 52.64	
SUN.	9	5 5 36.82	10.334	22 51 40.3	13.42	1 12.38	0.478	5 6 49.20	
Mon.	10	5 9 44.98	10.345	22 56 50.5	+ 12.41	1 0.78	0.489	5 10 45.76	
Tues.	11	5 13 53.39	10.355	23 1 36.4	11.40	0 48.93	0.499	5 14 42.32	
Wed.	12	5 18 2.02	10.364	23 5 58.1	10.39	0 36.86	0.508	5 18 38.88	
Thur.	13	5 22 10.86	10.372	23 9 55.3	+ 9.37	0 24.57	0.516	5 22 35.43	
Frid.	14	5 26 19.87	10.379	23 13 28.1	8.35	0 12.11	0.522	5 26 31.98	
Sat.	15	5 30 29.03	10.384	23 16 36.3	7.33	0 0.48	0.528	5 30 28.54	
SUN.	16	5 34 38.32	10.389	23 19 19.8	+ 6.30	0 13.22	0.532	5 34 25.10	
Mon.	17	5 38 47.70	10.393	23 21 38.6	5.27	0 26.04	0.536	5 38 21.66	
Tues.	18	5 42 57.16	10.395	23 23 32.7	4.24	0 38.94	0.539	5 42 18.22	
Wed.	19	5 47 6.67	10.397	23 25 2.0	+ 3.21	0 51.89	0.540	5 46 14.78	
Thur.	20	5 51 16.20	10.397	23 26 6.4	2.17	1 4.87	0.541	5 50 11.33	
Frid.	21	5 55 25.74	10.397	23 26 46.1	1.13	1 17.85	0.540	5 54 7.89	
Sat.	22	5 59 35.25	10.395	23 27 0.9	+ 0.10	1 30.80	0.539	5 58 4.45	
SUN.	23	6 3 44.72	10.393	23 26 50.9	- 0.93	1 43.72	0.537	6 2 1.00	
Mon.	24	6 7 54.13	10.390	23 26 16.1	1.96	1 56.57	0.534	6 5 57.56	
Tues.	25	6 12 3.45	10.387	23 25 16.5	- 2.99	2 9.33	0.530	6 9 54.12	
Wed.	26	6 16 12.68	10.382	23 23 52.2	4.02	2 22.00	0.526	6 13 50.68	
Thur.	27	6 20 21.80	10.377	23 22 3.3	5.05	2 34.57	0.521	6 17 47.23	
Frid.	28	6 24 30.77	10.371	23 19 49.7	- 6.07	2 46.98	0.515	6 21 43.79	
Sat.	29	6 28 39.60	10.364	23 17 11.5	7.09	2 59.25	0.508	6 25 40.35	
SUN.	30	6 32 48.26	10.357	23 14 8.8	8.11	3 11.35	0.500	6 29 36.91	
Mon.	31	6 36 56.72	10.348	N.23 10 41.7	- 9.13	3 23.26	0.492	6 33 33.46	

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign - indicates that north declinations are decreasing.

Diff. for 1 Hour,  
+ 9<sup>s</sup>.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
		$^{\circ}$ $'$ $''$	$'$ $''$	$''$	$''$			$^h$ $^m$ $^s$
1	152	69 50 14.8	50 10.4	143.70	— 0.10	0.006 1145	+ 28.0	19 21 32.44
2	153	70 47 43.1	47 38.6	143.67	0.24	0.006 1809	27.3	19 17 36.53
3	154	71 45 10.7	45 6.0	143.64	0.33	0.006 2456	26.6	19 13 40.62
4	155	72 42 37.7	42 32.8	143.61	— 0.41	0.006 3084	+ 25.8	19 9 44.71
5	156	73 40 4.0	39 59.0	143.58	0.47	0.006 3693	24.9	19 5 48.80
6	157	74 37 29.6	37 24.5	143.55	0.49	0.006 4280	24.0	19 1 52.89
7	158	75 34 54.6	34 49.3	143.52	— 0.49	0.006 4845	+ 23.1	18 57 56.98
8	159	76 32 18.9	32 13.4	143.50	0.46	0.006 5388	22.1	18 54 1.06
9	160	77 29 42.5	29 36.8	143.47	0.40	0.006 5907	21.1	18 50 5.15
10	161	78 27 5.4	26 59.5	143.44	— 0.32	0.006 6402	+ 20.1	18 46 9.24
11	162	79 24 27.5	24 21.5	143.41	0.21	0.006 6872	19.1	18 42 13.33
12	163	80 21 48.9	21 42.7	143.38	— 0.09	0.006 7319	18.1	18 38 17.42
13	164	81 19 9.5	19 3.2	143.35	+ 0.02	0.006 7741	+ 17.1	18 34 21.51
14	165	82 16 29.3	16 22.8	143.31	0.14	0.006 8139	16.1	18 30 25.60
15	166	83 13 48.4	13 41.7	143.28	0.26	0.006 8513	15.1	18 26 29.68
16	167	84 11 6.6	10 59.8	143.24	+ 0.37	0.006 8864	+ 14.2	18 22 33.77
17	168	85 8 24.0	8 17.0	143.21	0.47	0.006 9193	13.3	18 18 37.86
18	169	86 5 40.7	5 33.5	143.18	0.53	0.006 9501	12.4	18 14 41.95
19	170	87 2 56.5	2 49.2	143.15	+ 0.57	0.006 9788	+ 11.6	18 10 46.04
20	171	88 0 11.6	0 4.1	143.12	0.59	0.007 0055	10.8	18 6 50.13
21	172	88 57 25.9	57 18.2	143.09	0.58	0.007 0304	10.1	18 2 54.22
22	173	89 54 39.5	54 31.7	143.06	+ 0.52	0.007 0536	+ 9.4	17 58 58.31
23	174	90 51 52.6	51 44.5	143.03	0.46	0.007 0753	8.7	17 55 2.39
24	175	91 49 5.0	48 56.9	143.01	0.36	0.007 0955	8.1	17 51 6.48
25	176	92 46 17.1	46 8.7	143.00	+ 0.22	0.007 1143	+ 7.5	17 47 10.57
26	177	93 43 28.8	43 20.3	142.99	+ 0.08	0.007 1318	7.0	17 43 14.66
27	178	94 40 40.4	40 31.7	142.98	— 0.06	0.007 1480	6.4	17 39 18.75
28	179	95 37 51.8	37 42.9	142.98	— 0.21	0.007 1627	+ 5.8	17 35 22.84
29	180	96 35 3.2	34 54.1	142.98	0.34	0.007 1759	5.2	17 31 26.92
30	181	97 32 14.7	32 5.5	142.98	0.45	0.007 1876	4.5	17 27 31.01
31	182	98 29 26.4	29 17.0	142.99	— 0.54	0.007 1975	+ 3.7	17 23 35.10

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,  
— 9<sup>h</sup>.8296.  
(Table II.)



GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

SEMI- DIAMETER.

HORIZONTAL PARALLAX.

UPPER TRANSIT.

AGE.

Noon.

Midnight.

Noon.

Diff. for  
1 Hour.

Midnight.

Diff. for  
1 Hour.

Meridian of  
Greenwich.

Diff. for  
1 Hour.

Noon.

	' "	' "	' "	"	' "	"	h m	m	d
1	16 11.0	16 4.6	59 17.8	- 1.92	58 54.3	- 1.98	17 26.2	2.22	20.1
2	15 58.1	15 51.5	58 30.3	2.00	58 6.3	1.98	18 17.6	2.07	21.1
3	15 45.1	15 38.8	57 42.6	1.94	57 19.6	1.88	19 5.6	1.96	22.1
4	15 32.8	15 27.1	56 57.5	- 1.79	56 36.6	- 1.70	19 51.5	1.88	23.1
5	15 21.7	15 16.7	56 16.8	1.59	55 58.4	1.48	20 36.0	1.85	24.1
6	15 12.1	15 7.8	55 41.3	1.36	55 25.6	1.25	21 20.2	1.85	25.1
7	15 3.9	15 0.3	55 11.2	- 1.14	54 58.2	- 1.03	22 4.7	1.87	26.1
8	14 57.1	14 54.3	54 46.5	0.92	54 36.0	0.82	22 50.1	1.92	27.1
9	14 51.8	14 49.6	54 26.8	0.71	54 18.9	0.61	23 36.7	1.96	28.1
10	14 47.8	14 46.3	54 12.1	- 0.51	54 6.6	- 0.40	0	.	29.1
11	14 45.1	14 44.3	54 2.4	0.30	53 59.5	- 0.18	0 24.4	2.02	0.5
12	14 43.9	14 43.9	53 57.9	- 0.07	53 57.8	+ 0.05	1 12.8	2.02	1.5
13	14 44.3	14 45.1	53 59.2	+ 0.18	54 2.2	+ 0.32	2 1.4	2.02	2.5
14	14 46.3	14 48.1	54 6.9	0.47	54 13.4	0.62	2 49.6	1.99	3.5
15	14 50.4	14 53.3	54 21.9	0.79	54 32.4	0.95	3 36.9	1.95	4.5
16	14 56.7	15 0.7	54 44.9	+ 1.13	54 59.5	+ 1.30	4 23.3	1.91	5.5
17	15 5.2	15 10.4	55 16.3	1.48	55 35.2	1.66	5 8.8	1.89	6.5
18	15 16.1	15 22.3	55 56.1	1.82	56 19.0	1.98	5 54.0	1.89	7.5
19	15 29.0	15 36.2	56 43.7	+ 2.12	57 10.0	+ 2.24	6 39.5	1.92	8.5
20	15 43.7	15 51.4	57 37.4	2.32	58 5.7	2.37	7 26.4	2.00	9.5
21	15 59.2	16 6.9	58 34.4	2.38	59 2.8	2.33	8 15.5	2.12	10.5
22	16 14.4	16 21.5	59 30.4	+ 2.23	59 56.4	+ 2.08	9 8.0	2.27	11.5
23	16 28.0	16 33.7	60 20.2	1.86	60 41.1	1.59	10 4.5	2.44	12.5
24	16 38.4	16 41.9	60 58.3	1.26	61 11.4	0.89	11 5.2	2.60	13.5
25	16 44.2	16 45.1	61 19.8	+ 0.49	61 23.3	+ 0.08	12 9.0	2.68	14.5
26	16 44.7	16 43.0	61 21.7	- 0.34	61 15.1	- 0.74	13 13.6	2.66	15.5
27	16 39.9	16 35.6	61 3.8	1.12	60 48.3	1.45	14 16.4	2.54	16.5
28	16 30.4	16 24.3	60 29.0	- 1.74	60 6.6	- 1.96	15 15.6	2.38	17.5
29	16 17.5	16 10.3	59 41.8	2.13	59 15.3	2.26	16 10.4	2.20	18.5
30	16 2.8	15 55.2	58 47.8	2.31	58 19.9	2.32	17 1.3	2.05	19.5
31	15 47.7	15 40.3	57 52.2	- 2.29	57 25.0	- 2.22	17 48.8	1.94	20.5

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 1.					MONDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	21 23 8.32	2.4112	S. 17 30 8.0	8.108	0	23 11 54.13	2.1337	S. 9 31 51.1	11.307
1	21 25 32.81	2.4049	17 21 58.5	8.207	1	23 14 2.01	2.1291	9 20 31.6	11.342
2	21 27 56.91	2.3986	17 13 43.2	8.304	2	23 16 9.62	2.1244	9 9 10.0	11.377
3	21 30 20.64	2.3923	17 5 22.0	8.401	3	23 18 16.94	2.1197	8 57 46.4	11.410
4	21 32 43.99	2.3860	16 56 55.1	8.496	4	23 20 23.99	2.1152	8 46 20.8	11.442
5	21 35 6.96	2.3797	16 48 22.5	8.589	5	23 22 30.77	2.1107	8 34 53.3	11.473
6	21 37 29.55	2.3733	16 39 44.4	8.681	6	23 24 37.28	2.1063	8 23 24.0	11.503
7	21 39 51.76	2.3670	16 31 0.8	8.772	7	23 26 43.53	2.1020	8 11 52.9	11.532
8	21 42 13.59	2.3607	16 22 11.8	8.861	8	23 28 49.52	2.0977	8 0 20.1	11.560
9	21 44 35.05	2.3544	16 13 17.5	8.947	9	23 30 55.26	2.0935	7 48 45.7	11.587
10	21 46 56.12	2.3481	16 4 18.1	9.033	10	23 33 0.75	2.0893	7 37 9.7	11.612
11	21 49 16.82	2.3419	15 55 13.5	9.119	11	23 35 5.98	2.0852	7 25 32.2	11.637
12	21 51 37.15	2.3357	15 46 3.8	9.202	12	23 37 10.97	2.0811	7 13 53.3	11.660
13	21 53 57.10	2.3294	15 36 49.2	9.284	13	23 39 15.72	2.0772	7 2 13.0	11.682
14	21 56 16.68	2.3232	15 27 29.7	9.364	14	23 41 20.23	2.0732	6 50 31.4	11.704
15	21 58 35.88	2.3170	15 18 5.5	9.443	15	23 43 24.51	2.0694	6 38 48.5	11.725
16	22 0 54.72	2.3108	15 8 36.5	9.522	16	23 45 28.56	2.0656	6 27 4.4	11.744
17	22 3 13.18	2.3047	14 59 2.9	9.598	17	23 47 32.38	2.0618	6 15 19.2	11.762
18	22 5 31.28	2.2986	14 49 24.8	9.672	18	23 49 35.98	2.0582	6 3 32.9	11.780
19	22 7 49.01	2.2925	14 39 42.3	9.746	19	23 51 39.36	2.0546	5 51 45.6	11.796
20	22 10 6.38	2.2864	14 29 55.3	9.818	20	23 53 42.53	2.0511	5 39 57.4	11.812
21	22 12 23.38	2.2803	14 20 4.1	9.888	21	23 55 45.49	2.0476	5 28 8.2	11.827
22	22 14 40.02	2.2743	14 10 8.7	9.958	22	23 57 48.24	2.0442	5 16 18.2	11.839
23	22 16 56.30	2.2684	S. 14 0 9.1	10.027	23	23 59 50.79	2.0407	S. 5 4 27.5	11.852
SUNDAY 2.					TUESDAY 4.				
0	22 19 12.23	2.2625	S. 13 50 5.5	10.092	0	0 1 53.13	2.0374	S. 4 52 36.0	11.863
1	22 21 27.80	2.2566	13 39 58.0	10.157	1	0 3 55.28	2.0342	4 40 43.9	11.874
2	22 23 43.02	2.2508	13 29 46.6	10.222	2	0 5 57.24	2.0311	4 28 51.1	11.884
3	22 25 57.90	2.2450	13 19 31.4	10.285	3	0 7 59.01	2.0280	4 16 57.8	11.893
4	22 28 12.42	2.2392	13 9 12.4	10.346	4	0 10 0.60	2.0250	4 5 4.0	11.901
5	22 30 26.60	2.2334	12 58 49.9	10.406	5	0 12 2.01	2.0220	3 53 9.7	11.907
6	22 32 40.43	2.2277	12 48 23.7	10.465	6	0 14 3.24	2.0191	3 41 15.1	11.913
7	22 34 53.93	2.2222	12 37 54.1	10.522	7	0 16 4.30	2.0162	3 29 20.1	11.919
8	22 37 7.09	2.2165	12 27 21.1	10.577	8	0 18 5.19	2.0134	3 17 24.8	11.923
9	22 39 19.91	2.2109	12 16 44.8	10.632	9	0 20 5.91	2.0107	3 5 29.3	11.926
10	22 41 32.40	2.2054	12 6 5.2	10.687	10	0 22 6.48	2.0081	2 53 33.7	11.928
11	22 43 44.56	2.2000	11 55 22.4	10.739	11	0 24 6.88	2.0054	2 41 37.9	11.930
12	22 45 56.40	2.1946	11 44 36.5	10.790	12	0 26 7.13	2.0029	2 29 42.1	11.930
13	22 48 7.91	2.1892	11 33 47.6	10.839	13	0 28 7.23	2.0005	2 17 46.3	11.930
14	22 50 19.11	2.1839	11 22 55.8	10.887	14	0 30 7.19	1.9981	2 5 50.5	11.930
15	22 52 29.98	2.1786	11 12 1.1	10.936	15	0 32 7.00	1.9957	1 53 54.7	11.928
16	22 54 40.54	2.1735	11 1 3.5	10.982	16	0 34 6.67	1.9934	1 41 59.1	11.925
17	22 56 50.80	2.1683	10 50 3.3	11.026	17	0 36 6.21	1.9911	1 30 3.7	11.921
18	22 59 0.74	2.1632	10 39 0.4	11.070	18	0 38 5.61	1.9890	1 18 8.6	11.917
19	23 1 10.38	2.1582	10 27 54.9	11.112	19	0 40 4.89	1.9869	1 6 13.7	11.912
20	23 3 19.72	2.1532	10 16 46.9	11.154	20	0 42 4.04	1.9848	0 54 19.2	11.905
21	23 5 28.76	2.1482	10 5 36.4	11.194	21	0 44 3.07	1.9829	0 42 25.1	11.898
22	23 7 37.51	2.1433	9 54 23.6	11.233	22	0 46 1.99	1.9811	0 30 31.4	11.891
23	23 9 45.96	2.1385	9 43 8.5	11.271	23	0 48 0.80	1.9792	0 18 38.2	11.882
24	23 11 54.13	2.1337	S. 9 31 51.1	11.307	24	0 49 59.49	1.9773	S. 0 6 45.5	11.873

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 5.					FRIDAY 7.				
0	h m s		S. 0 6 45.5	11.873	0	h m s		N. 8 57 50.4	10.540
1	0 49 59.49	1.9773	N. 0 5 6.6	11.862	1	2 23 54.45	1.9557	9 8 21.5	10.495
2	0 51 58.08	1.9756	0 16 58.0	11.852	2	2 25 51.81	1.9563	9 18 49.8	10.449
3	0 53 56.56	1.9739	0 28 48.8	11.840	3	2 27 49.21	1.9571	9 29 15.4	10.402
4	0 55 54.95	1.9723	0 40 38.8	11.827	4	2 29 46.66	1.9578	9 39 38.1	10.355
5	0 57 53.24	1.9707	0 52 28.0	11.813	5	2 31 44.15	1.9587	9 49 58.0	10.308
6	0 59 51.44	1.9692	1 4 16.4	11.800	6	2 33 41.70	1.9596	10 0 15.1	10.260
7	1 1 49.55	1.9678	1 16 4.0	11.785	7	2 35 39.30	1.9605	10 10 29.2	10.210
8	1 3 47.58	1.9665	1 27 50.6	11.769	8	2 37 36.96	1.9615	10 20 40.3	10.161
9	1 5 45.53	1.9652	1 39 36.3	11.752	9	2 39 34.68	1.9625	10 30 48.5	10.111
10	1 7 43.40	1.9639	1 51 20.9	11.735	10	2 41 32.46	1.9635	10 40 53.6	10.059
11	1 9 41.20	1.9627	2 3 4.5	11.717	11	2 43 30.30	1.9645	10 50 55.6	10.007
12	1 11 38.92	1.9615	2 14 47.0	11.699	12	2 45 28.20	1.9656	11 0 54.5	9.955
13	1 13 36.58	1.9605	2 26 28.4	11.679	13	2 47 26.17	1.9667	11 10 50.2	9.902
14	1 15 34.18	1.9594	2 38 8.5	11.658	14	2 49 24.20	1.9678	11 20 42.7	9.848
15	1 17 31.71	1.9584	2 49 47.4	11.637	15	2 51 22.31	1.9691	11 30 32.0	9.794
16	1 19 29.19	1.9575	3 1 25.0	11.616	16	2 53 20.49	1.9703	11 40 18.0	9.739
17	1 21 26.61	1.9566	3 13 1.3	11.594	17	2 55 18.74	1.9715	11 50 0.7	9.683
18	1 23 23.98	1.9558	3 24 36.3	11.571	18	2 57 17.07	1.9727	11 59 40.0	9.627
19	1 25 21.31	1.9551	3 36 9.8	11.546	19	2 59 15.47	1.9740	12 9 15.9	9.570
20	1 27 18.59	1.9543	3 47 41.8	11.521	20	3 1 13.95	1.9754	12 18 48.4	9.512
21	1 29 15.83	1.9537	3 59 12.3	11.496	21	3 3 12.52	1.9768	12 28 17.4	9.454
22	1 31 13.03	1.9531	4 10 41.3	11.470	22	3 5 11.17	1.9782	12 37 42.9	9.396
23	1 33 10.20	1.9526	4 22 8.7	11.442	23	3 7 9.90	1.9796	N. 12 47 4.9	9.336
24	1 35 7.34	1.9521				3 9 8.72	1.9810		
THURSDAY 6.					SATURDAY 8.				
0	1 37 4.45	1.9517	N. 4 33 34.4	11.415	0	3 11 7.62	1.9824	N. 12 56 23.2	9.275
1	1 39 1.54	1.9512	4 44 58.5	11.387	1	3 13 6.61	1.9839	13 5 37.9	9.215
2	1 40 58.60	1.9508	4 56 20.8	11.357	2	3 15 5.69	1.9855	13 14 49.0	9.154
3	1 42 55.64	1.9506	5 7 41.4	11.327	3	3 17 4.87	1.9870	13 23 56.4	9.092
4	1 44 52.67	1.9504	5 19 0.1	11.297	4	3 19 4.13	1.9885	13 33 0.0	9.029
5	1 46 49.69	1.9502	5 30 17.0	11.266	5	3 21 3.49	1.9902	13 41 59.9	8.966
6	1 48 46.70	1.9501	5 41 32.0	11.234	6	3 23 2.95	1.9917	13 50 55.9	8.902
7	1 50 43.70	1.9499	5 52 45.1	11.202	7	3 25 2.50	1.9933	13 59 48.1	8.837
8	1 52 40.69	1.9499	6 3 56.2	11.168	8	3 27 2.15	1.9950	14 8 36.4	8.772
9	1 54 37.69	1.9500	6 15 5.3	11.134	9	3 29 1.90	1.9967	14 17 20.7	8.706
10	1 56 34.69	1.9500	6 26 12.3	11.099	10	3 31 1.75	1.9983	14 26 1.1	8.640
11	1 58 31.69	1.9501	6 37 17.2	11.064	11	3 33 1.70	2.0000	14 34 37.5	8.572
12	2 0 28.70	1.9502	6 48 20.0	11.028	12	3 35 1.75	2.0017	14 43 9.8	8.505
13	2 2 25.72	1.9505	6 59 20.6	10.991	13	3 37 1.90	2.0034	14 51 38.1	8.437
14	2 4 22.76	1.9507	7 10 18.9	10.953	14	3 39 2.16	2.0052	15 0 2.2	8.367
15	2 6 19.81	1.9510	7 21 15.0	10.915	15	3 41 2.52	2.0069	15 8 22.2	8.298
16	2 8 16.88	1.9513	7 32 8.7	10.876	16	3 43 2.99	2.0087	15 16 38.0	8.228
17	2 10 13.97	1.9517	7 43 0.1	10.837	17	3 45 3.56	2.0104	15 24 49.6	8.157
18	2 12 11.09	1.9522	7 53 49.1	10.796	18	3 47 4.24	2.0122	15 32 56.9	8.087
19	2 14 8.24	1.9527	8 4 35.6	10.755	19	3 49 5.03	2.0141	15 41 0.0	8.015
20	2 16 5.41	1.9532	8 15 19.7	10.714	20	3 51 5.93	2.0158	15 48 58.7	7.942
21	2 18 2.62	1.9537	8 26 1.3	10.672	21	3 53 6.93	2.0177	15 56 53.0	7.869
22	2 19 59.86	1.9542	8 36 40.3	10.628	22	3 55 8.05	2.0196	16 4 43.0	7.796
23	2 21 57.13	1.9549	8 47 16.7	10.584	23	3 57 9.28	2.0213	16 12 28.5	7.721
24	2 23 54.45	1.9557	N. 8 57 50.4	10.540	24	3 59 10.61	2.0231	N. 16 20 9.5	7.647

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 9.					TUESDAY 11.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
0	3 59 10.61	2.0231	N.16 20 9.5	7.647	0	5 38 19.98	2.1031	N.20 51 9.1	3.470
1	4 1 12.05	2.0250	16 27 46.1	7.572	1	5 40 26.20	2.1042	20 54 34.4	3.373
2	4 3 13.61	2.0268	16 35 18.1	7.495	2	5 42 32.49	2.1054	20 57 53.9	3.276
3	4 5 15.27	2.0287	16 42 45.5	7.418	3	5 44 38.85	2.1065	21 1 7.5	3.178
4	4 7 17.05	2.0306	16 50 8.3	7.342	4	5 46 45.27	2.1076	21 4 15.3	3.081
5	4 9 18.94	2.0324	16 57 26.5	7.264	5	5 48 51.76	2.1087	21 7 17.2	2.983
6	4 11 20.94	2.0343	17 4 40.0	7.186	6	5 50 58.31	2.1097	21 10 13.3	2.885
7	4 13 23.05	2.0362	17 11 48.8	7.107	7	5 53 4.92	2.1107	21 13 3.4	2.786
8	4 15 25.28	2.0381	17 18 52.9	7.028	8	5 55 11.59	2.1116	21 15 47.6	2.687
9	4 17 27.62	2.0398	17 25 52.2	6.948	9	5 57 18.31	2.1125	21 18 25.9	2.589
10	4 19 30.06	2.0417	17 32 46.7	6.867	10	5 59 25.09	2.1134	21 20 58.3	2.490
11	4 21 32.62	2.0437	17 39 36.3	6.787	11	6 1 31.92	2.1142	21 23 24.7	2.390
12	4 23 35.30	2.0455	17 46 21.1	6.706	12	6 3 38.80	2.1151	21 25 45.1	2.291
13	4 25 38.08	2.0473	17 53 1.0	6.624	13	6 5 45.73	2.1158	21 27 59.6	2.191
14	4 27 40.97	2.0491	17 59 36.0	6.542	14	6 7 52.70	2.1166	21 30 8.0	2.090
15	4 29 43.97	2.0510	18 6 6.0	6.458	15	6 9 59.72	2.1173	21 32 10.4	1.991
16	4 31 47.09	2.0528	18 12 31.0	6.375	16	6 12 6.78	2.1179	21 34 6.9	1.892
17	4 33 50.31	2.0546	18 18 51.0	6.291	17	6 14 13.87	2.1185	21 35 57.4	1.791
18	4 35 53.64	2.0564	18 25 5.9	6.207	18	6 16 21.00	2.1192	21 37 41.8	1.689
19	4 37 57.08	2.0582	18 31 15.8	6.122	19	6 18 28.17	2.1197	21 39 20.1	1.588
20	4 40 0.62	2.0600	18 37 20.5	6.036	20	6 20 35.37	2.1202	21 40 52.4	1.488
21	4 42 4.28	2.0618	18 43 20.1	5.951	21	6 22 42.60	2.1207	21 42 18.7	1.387
22	4 44 8.04	2.0636	18 49 14.6	5.864	22	6 24 49.86	2.1212	21 43 38.9	1.286
23	4 46 11.91	2.0653	N.18 55 3.8	5.777	23	6 26 57.14	2.1215	N.21 44 53.0	1.184
MONDAY 10.					WEDNESDAY 12.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
0	4 48 15.88	2.0671	N.19 0 47.8	5.689	0	6 29 4.44	2.1219	N.21 46 1.0	1.082
1	4 50 19.96	2.0688	19 6 26.5	5.602	1	6 31 11.77	2.1222	21 47 2.9	0.982
2	4 52 24.14	2.0705	19 12 0.0	5.514	2	6 33 19.11	2.1225	21 47 58.8	0.881
3	4 54 28.42	2.0722	19 17 28.2	5.425	3	6 35 26.47	2.1227	21 48 48.6	0.779
4	4 56 32.80	2.0739	19 22 51.0	5.336	4	6 37 33.84	2.1230	21 49 32.3	0.677
5	4 58 37.29	2.0757	19 28 8.5	5.247	5	6 39 41.23	2.1232	21 50 9.8	0.575
6	5 0 41.88	2.0773	19 33 20.6	5.156	6	6 41 48.62	2.1232	21 50 41.3	0.474
7	5 2 46.56	2.0788	19 38 27.2	5.065	7	6 43 56.02	2.1233	21 51 6.7	0.372
8	5 4 51.34	2.0805	19 43 28.4	4.975	8	6 46 3.42	2.1234	21 51 25.9	0.270
9	5 6 56.22	2.0821	19 48 24.2	4.884	9	6 48 10.83	2.1234	21 51 39.1	0.169
10	5 9 1.19	2.0837	19 53 14.5	4.792	10	6 50 18.23	2.1233	21 51 46.2	+ 0.067
11	5 11 6.26	2.0852	19 57 59.2	4.699	11	6 52 25.63	2.1233	21 51 47.1	- 0.035
12	5 13 11.42	2.0867	20 2 38.4	4.607	12	6 54 33.03	2.1232	21 51 42.0	0.137
13	5 15 16.67	2.0882	20 7 12.1	4.514	13	6 56 40.42	2.1231	21 51 30.7	0.288
14	5 17 22.01	2.0897	20 11 40.1	4.421	14	6 58 47.80	2.1229	21 51 13.4	0.340
15	5 19 27.44	2.0912	20 16 2.6	4.327	15	7 0 55.17	2.1227	21 50 49.9	0.442
16	5 21 32.95	2.0926	20 20 19.4	4.233	16	7 3 2.52	2.1223	21 50 20.4	0.543
17	5 23 38.55	2.0940	20 24 30.6	4.139	17	7 5 9.85	2.1221	21 49 44.7	0.646
18	5 25 44.23	2.0953	20 28 36.1	4.045	18	7 7 17.17	2.1218	21 49 2.9	0.747
19	5 27 49.99	2.0967	20 32 36.0	3.950	19	7 9 24.47	2.1214	21 48 15.1	0.847
20	5 29 55.84	2.0981	20 36 30.1	3.854	20	7 11 31.74	2.1209	21 47 21.2	0.948
21	5 32 1.76	2.0993	20 40 18.5	3.758	21	7 13 38.98	2.1205	21 46 21.3	1.050
22	5 34 7.76	2.1006	20 44 1.1	3.662	22	7 15 46.20	2.1201	21 45 15.2	1.152
23	5 36 13.83	2.1018	20 47 38.0	3.567	23	7 17 53.39	2.1196	21 44 3.1	1.253
24	5 38 19.98	2.1031	N.20 51 9.1	3.470	24	7 20 0.55	2.1190	N.21 42 44.9	1.353

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 13.					SATURDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	7 20 0.55	2.1190	N. 21 42 44.9	1.353	1	9 0 31.32	2.0607	N. 18 45 34.5	5.915
2	7 22 7.67	2.1184	21 41 20.7	1.454	2	9 2 34.92	2.0592	18 39 37.0	6.002
3	7 24 14.76	2.1178	21 39 50.4	1.555	3	9 4 38.42	2.0576	18 33 34.3	6.088
4	7 26 21.81	2.1172	21 38 14.1	1.655	4	9 6 41.83	2.0560	18 27 26.4	6.174
5	7 28 28.82	2.1164	21 36 31.8	1.756	5	9 8 45.14	2.0544	18 21 13.4	6.259
6	7 30 35.78	2.1157	21 34 43.4	1.856	6	9 10 48.36	2.0528	18 14 55.3	6.344
7	7 32 42.70	2.1149	21 32 49.1	1.956	7	9 12 51.48	2.0513	18 8 32.1	6.428
8	7 34 49.57	2.1142	21 30 48.7	2.056	8	9 14 54.51	2.0497	18 2 3.9	6.513
9	7 36 56.40	2.1133	21 28 42.4	2.155	9	9 16 57.44	2.0481	17 55 30.6	6.597
10	7 39 3.17	2.1124	21 26 30.1	2.255	10	9 19 0.28	2.0465	17 48 52.3	6.679
11	7 41 9.89	2.1116	21 24 11.8	2.354	11	9 21 3.02	2.0449	17 42 9.1	6.761
12	7 43 16.56	2.1107	21 21 47.6	2.453	12	9 23 5.67	2.0433	17 35 21.0	6.843
13	7 45 23.17	2.1097	21 19 17.4	2.552	13	9 25 8.22	2.0417	17 28 27.9	6.926
14	7 47 29.72	2.1087	21 16 41.3	2.651	14	9 27 10.68	2.0402	17 21 29.9	7.007
15	7 49 36.22	2.1077	21 13 59.3	2.749	15	9 29 13.05	2.0387	17 14 27.1	7.087
16	7 51 42.65	2.1067	21 11 11.4	2.847	16	9 31 15.32	2.0371	17 7 19.4	7.168
17	7 53 49.02	2.1056	21 8 17.6	2.946	17	9 33 17.50	2.0356	17 0 6.9	7.248
18	7 55 55.32	2.1045	21 5 17.9	3.043	18	9 35 19.59	2.0341	16 52 49.6	7.327
19	7 58 1.56	2.1034	21 2 12.4	3.141	19	9 37 21.59	2.0326	16 45 27.6	7.407
20	8 0 7.73	2.1022	20 59 1.0	3.237	20	9 39 23.50	2.0311	16 38 0.8	7.485
21	8 2 13.83	2.1011	20 55 43.9	3.334	21	9 41 25.32	2.0297	16 30 29.4	7.562
22	8 4 19.86	2.0998	20 52 20.9	3.432	22	9 43 27.06	2.0282	16 22 53.3	7.640
23	8 6 25.81	2.0986	20 48 52.1	3.528	23	9 45 28.70	2.0267	16 15 12.6	7.717
24	8 8 31.69	2.0974	N. 20 45 17.5	3.624	24	9 47 30.26	2.0252	N. 16 7 27.2	7.794
FRIDAY 14.					SUNDAY 16.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	8 10 37.50	2.0962	N. 20 41 37.2	3.719	1	9 49 31.73	2.0238	N. 15 59 37.3	7.870
2	8 12 43.23	2.0948	20 37 51.2	3.815	2	9 51 33.12	2.0223	15 51 42.8	7.945
3	8 14 48.88	2.0935	20 33 59.4	3.911	3	9 53 34.43	2.0211	15 43 43.9	8.020
4	8 16 54.45	2.0922	20 30 1.9	4.006	4	9 55 35.65	2.0197	15 35 40.4	8.095
5	8 18 59.94	2.0908	20 25 58.7	4.100	5	9 57 36.79	2.0184	15 27 32.5	8.169
6	8 21 5.35	2.0894	20 21 49.9	4.193	6	9 59 37.86	2.0171	15 19 20.1	8.242
7	8 23 10.67	2.0880	20 17 35.5	4.287	7	10 1 38.84	2.0157	15 11 3.4	8.315
8	8 25 15.91	2.0867	20 13 15.4	4.382	8	10 3 39.75	2.0145	15 2 42.3	8.388
9	8 27 21.07	2.0852	20 8 49.7	4.475	9	10 5 40.58	2.0132	14 54 16.8	8.460
10	8 29 26.14	2.0838	20 4 18.4	4.567	10	10 7 41.33	2.0120	14 45 47.1	8.531
11	8 31 31.12	2.0823	19 59 41.6	4.659	11	10 9 42.02	2.0108	14 37 13.1	8.602
12	8 33 36.02	2.0808	19 54 59.3	4.752	12	10 11 42.63	2.0096	14 28 34.8	8.673
13	8 35 40.82	2.0793	19 50 11.4	4.844	13	10 13 43.17	2.0081	14 19 52.3	8.742
14	8 37 45.54	2.0779	19 45 18.0	4.936	14	10 15 43.64	2.0073	14 11 5.7	8.812
15	8 39 50.17	2.0763	19 40 19.1	5.027	15	10 17 44.05	2.0062	14 2 14.9	8.881
16	8 41 54.70	2.0747	19 35 14.8	5.117	16	10 19 44.39	2.0052	13 53 20.0	8.948
17	8 43 59.14	2.0732	19 30 5.1	5.207	17	10 21 44.67	2.0042	13 44 21.1	9.016
18	8 46 3.49	2.0717	19 24 50.0	5.297	18	10 23 44.89	2.0032	13 35 18.1	9.084
19	8 48 7.75	2.0702	19 19 29.4	5.387	19	10 25 45.05	2.0022	13 26 11.0	9.151
20	8 50 11.91	2.0686	19 14 3.5	5.476	20	10 27 45.15	2.0012	13 17 0.0	9.217
21	8 52 15.98	2.0671	19 8 32.3	5.564	21	10 29 45.19	2.0002	13 7 45.0	9.282
22	8 54 19.96	2.0655	19 2 55.8	5.653	22	10 31 45.18	1.9993	12 58 26.1	9.347
23	8 56 23.84	2.0639	18 57 13.9	5.742	23	10 33 45.11	1.9984	12 49 3.3	9.412
24	8 58 27.63	2.0623	18 51 26.8	5.828	24	10 35 44.99	1.9977	12 39 36.7	9.476
	9 0 31.32	2.0607	N. 18 45 34.5	5.915		10 37 44.83	1.9969	N. 12 30 6.2	9.540

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 17.					WEDNESDAY 19.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
1	10 37 44.83	1.9969	12 30 6.2	9.540	1	12 13 30.49	2.0122	3 50 15.6	11.878
2	10 39 44.62	1.9962	12 20 31.9	9.602	2	12 15 31.27	2.0138	3 38 21.9	11.911
3	10 41 44.37	1.9955	12 10 53.9	9.664	3	12 17 32.15	2.0156	3 26 26.3	11.942
4	10 43 44.08	1.9947	12 1 12.2	9.726	4	12 19 33.14	2.0173	3 14 28.9	11.972
5	10 45 43.74	1.9941	11 51 26.8	9.787	5	12 21 34.23	2.0191	3 2 29.6	12.003
6	10 47 43.37	1.9936	11 41 37.7	9.848	6	12 23 35.43	2.0210	2 50 28.5	12.032
7	10 49 42.97	1.9930	11 31 45.0	9.908	7	12 25 36.75	2.0229	2 38 25.7	12.061
8	10 51 42.53	1.9924	11 21 48.7	9.968	8	12 27 38.18	2.0249	2 26 21.2	12.088
9	10 53 42.06	1.9920	11 11 48.8	10.027	9	12 29 39.74	2.0271	2 14 15.1	12.115
10	10 55 41.57	1.9916	11 1 45.4	10.086	10	12 31 41.43	2.0292	2 2 7.4	12.141
11	10 57 41.05	1.9911	10 51 38.5	10.143	11	12 33 43.24	2.0313	1 49 58.2	12.166
12	10 59 40.50	1.9907	10 41 28.2	10.200	12	12 35 45.19	2.0336	1 37 47.5	12.191
13	11 1 39.94	1.9905	10 31 14.5	10.257	13	12 37 47.27	2.0359	1 25 35.3	12.214
14	11 3 39.36	1.9902	10 20 57.4	10.312	14	12 39 49.50	2.0383	1 13 21.8	12.237
15	11 5 38.77	1.9900	10 10 37.0	10.368	15	12 41 51.87	2.0407	1 1 6.9	12.258
16	11 7 38.16	1.9898	10 0 13.2	10.424	16	12 43 54.39	2.0433	0 48 50.8	12.279
17	11 9 37.54	1.9896	9 49 46.1	10.478	17	12 45 57.07	2.0460	0 36 33.4	12.300
18	11 11 36.92	1.9895	9 39 15.9	10.531	18	12 47 59.91	2.0486	0 24 14.8	12.319
19	11 13 36.29	1.9895	9 28 42.4	10.585	19	12 50 2.90	2.0512	N. 0 11 55.1	12.337
20	11 15 35.66	1.9896	9 18 5.7	10.637	20	12 52 6.06	2.0540	S. 0 0 25.7	12.355
21	11 17 35.04	1.9897	9 7 26.0	10.688	21	12 54 9.38	2.0568	0 12 47.5	12.371
22	11 19 34.42	1.9897	8 56 43.1	10.740	22	12 56 12.88	2.0597	0 25 10.2	12.386
23	11 21 33.80	1.9898	8 45 57.2	10.791	23	12 58 16.55	2.0627	0 37 33.8	12.401
24	11 23 33.19	1.9900	N. 8 35 8.2	10.841	24	13 0 20.41	2.0658	S. 0 49 58.3	12.415
TUESDAY 18.					THURSDAY 20.				
0	h m s	s	N. ° ' "	"	0	h m s	s	S. ° ' "	"
1	11 25 32.60	1.9902	8 24 16.3	10.890	1	13 2 24.45	2.0689	1 2 23.6	12.427
2	11 27 32.02	1.9905	8 13 21.4	10.939	2	13 4 28.68	2.0721	1 14 49.6	12.439
3	11 29 31.46	1.9909	8 2 23.6	10.987	3	13 6 33.10	2.0753	1 27 16.3	12.450
4	11 31 30.93	1.9913	7 51 23.0	11.034	4	13 8 37.72	2.0787	1 39 43.6	12.460
5	11 33 30.42	1.9917	7 40 19.5	11.082	5	13 10 42.54	2.0820	1 52 11.5	12.468
6	11 35 29.94	1.9922	7 29 13.2	11.128	6	13 12 47.56	2.0854	2 4 39.8	12.476
7	11 37 29.49	1.9927	7 18 4.1	11.174	7	13 14 52.79	2.0890	2 17 8.6	12.483
8	11 39 29.07	1.9933	7 6 52.3	11.218	8	13 16 58.24	2.0926	2 29 37.8	12.489
9	11 41 28.69	1.9940	6 55 37.9	11.263	9	13 19 3.90	2.0962	2 42 7.3	12.494
10	11 43 28.35	1.9948	6 44 20.8	11.307	10	13 21 9.78	2.0999	2 54 37.1	12.497
11	11 45 28.06	1.9956	6 33 1.1	11.349	11	13 23 15.89	2.1037	3 7 7.0	12.500
12	11 47 27.82	1.9963	6 21 38.9	11.392	12	13 25 22.22	2.1075	3 19 37.1	12.502
13	11 49 27.62	1.9972	6 10 14.1	11.433	13	13 27 28.79	2.1115	3 32 7.2	12.502
14	11 51 27.48	1.9981	5 58 46.9	11.474	14	13 29 35.60	2.1154	3 44 37.3	12.501
15	11 53 27.39	1.9991	5 47 17.2	11.515	15	13 31 42.64	2.1194	3 57 7.3	12.499
16	11 55 27.37	2.0002	5 35 45.1	11.554	16	13 33 49.93	2.1236	4 9 37.2	12.497
17	11 57 27.41	2.0012	5 24 10.7	11.593	17	13 35 57.47	2.1277	4 22 6.9	12.492
18	11 59 27.52	2.0024	5 12 33.9	11.632	18	13 38 5.26	2.1319	4 34 36.3	12.487
19	12 1 27.70	2.0037	5 0 54.9	11.668	19	13 40 13.30	2.1362	4 47 5.3	12.480
20	12 3 27.96	2.0049	4 49 13.7	11.706	20	13 42 21.61	2.1407	4 59 33.9	12.472
21	12 5 28.29	2.0062	4 37 30.2	11.742	21	13 44 30.18	2.1451	5 12 2.0	12.464
22	12 7 28.71	2.0077	4 25 44.7	11.777	22	13 46 39.02	2.1496	5 24 29.6	12.454
23	12 9 29.21	2.0091	4 13 57.0	11.812	23	13 48 48.13	2.1541	5 36 56.5	12.443
24	12 11 29.80	2.0107	4 2 7.3	11.845	24	13 50 57.51	2.1587	5 49 22.7	12.431
		2.0122	N. 3 50 15.6	11.878			2.1635	S. 6 1 48.2	12.417

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 21.					SUNDAY 23.				
0	13 53 7.18	2.1635	S. 6 1 48.2	12.417	0	15 43 23.96	2.4471	S. 15 15 23.5	10.054
1	13 55 17.13	2.1682	6 14 12.8	12.402	1	15 45 50.98	2.4537	15 25 24.1	9.964
2	13 57 27.36	2.1730	6 26 36.4	12.385	2	15 48 18.40	2.4603	15 35 19.2	9.872
3	13 59 37.89	2.1779	6 38 59.0	12.368	3	15 50 46.22	2.4669	15 45 8.8	9.780
4	14 1 48.71	2.1828	6 51 20.6	12.350	4	15 53 14.43	2.4734	15 54 52.8	9.686
5	14 3 59.83	2.1878	7 3 41.0	12.329	5	15 55 43.03	2.4799	16 4 31.1	9.589
6	14 6 11.25	2.1928	7 16 0.1	12.308	6	15 58 12.02	2.4865	16 14 3.5	9.491
7	14 8 22.97	2.1980	7 28 18.0	12.286	7	16 0 41.41	2.4931	16 23 30.0	9.392
8	14 10 35.01	2.2032	7 40 34.4	12.261	8	16 3 11.19	2.4995	16 32 50.5	9.291
9	14 12 47.36	2.2084	7 52 49.3	12.236	9	16 5 41.35	2.5060	16 42 4.9	9.187
10	14 15 0.02	2.2137	8 5 2.7	12.209	10	16 8 11.91	2.5125	16 51 13.0	9.082
11	14 17 13.00	2.2191	8 17 14.4	12.181	11	16 10 42.85	2.5188	17 0 14.8	8.976
12	14 19 26.31	2.2245	8 29 24.4	12.152	12	16 13 14.17	2.5252	17 9 10.1	8.867
13	14 21 39.94	2.2299	8 41 32.6	12.120	13	16 15 45.87	2.5316	17 17 58.9	8.757
14	14 23 53.90	2.2355	8 53 38.8	12.087	14	16 18 17.96	2.5380	17 26 41.0	8.645
15	14 26 8.20	2.2411	9 5 43.1	12.054	15	16 20 50.43	2.5442	17 35 16.3	8.532
16	14 28 22.83	2.2467	9 17 45.3	12.019	16	16 23 23.27	2.5504	17 43 44.8	8.417
17	14 30 37.80	2.2523	9 29 45.4	11.982	17	16 25 56.48	2.5566	17 52 6.3	8.300
18	14 32 53.11	2.2581	9 41 43.2	11.943	18	16 28 30.06	2.5627	18 0 20.8	8.182
19	14 35 8.77	2.2639	9 53 38.6	11.903	19	16 31 4.00	2.5687	18 8 28.1	8.062
20	14 37 24.78	2.2697	10 5 31.6	11.862	20	16 33 38.31	2.5748	18 16 28.2	7.940
21	14 39 41.14	2.2756	10 17 22.1	11.820	21	16 36 12.98	2.5808	18 24 20.9	7.817
22	14 41 57.85	2.2814	10 29 10.0	11.776	22	16 38 48.01	2.5867	18 32 6.2	7.692
23	14 44 14.91	2.2874	S. 10 40 55.2	11.730	23	16 41 23.39	2.5925	S. 18 39 43.9	7.564
SATURDAY 22.					MONDAY 24.				
0	14 46 32.34	2.2935	S. 10 52 37.6	11.682	0	16 43 59.11	2.5982	S. 18 47 13.9	7.436
1	14 48 50.13	2.2996	11 4 17.1	11.633	1	16 46 35.18	2.6040	18 54 36.2	7.306
2	14 51 8.29	2.3057	11 15 53.6	11.582	2	16 49 11.59	2.6097	19 1 50.6	7.174
3	14 53 26.81	2.3118	11 27 27.0	11.530	3	16 51 48.34	2.6152	19 8 57.1	7.042
4	14 55 45.70	2.3179	11 38 57.2	11.477	4	16 54 25.41	2.6206	19 15 55.6	6.907
5	14 58 4.96	2.3242	11 50 24.2	11.422	5	16 57 2.81	2.6260	19 22 46.0	6.772
6	15 0 24.60	2.3305	12 1 47.8	11.365	6	16 59 40.53	2.6313	19 29 28.2	6.635
7	15 2 44.62	2.3367	12 13 8.0	11.307	7	17 2 18.57	2.6366	19 36 2.1	6.495
8	15 5 5.01	2.3430	12 24 24.6	11.246	8	17 4 56.92	2.6417	19 42 27.6	6.354
9	15 7 25.78	2.3494	12 35 37.5	11.184	9	17 7 35.57	2.6467	19 48 44.6	6.212
10	15 9 46.94	2.3558	12 46 46.7	11.121	10	17 10 14.52	2.6516	19 54 53.1	6.070
11	15 12 8.48	2.3622	12 57 52.0	11.056	11	17 12 53.76	2.6563	20 0 53.0	5.926
12	15 14 30.40	2.3686	13 8 53.4	10.989	12	17 15 33.28	2.6610	20 6 44.2	5.780
13	15 16 52.71	2.3751	13 19 50.7	10.920	13	17 18 13.08	2.6657	20 12 26.6	5.632
14	15 19 15.41	2.3815	13 30 43.8	10.849	14	17 20 53.16	2.6702	20 18 0.1	5.483
15	15 21 38.49	2.3880	13 41 32.6	10.777	15	17 23 33.50	2.6745	20 23 24.6	5.334
16	15 24 1.97	2.3946	13 52 17.1	10.704	16	17 26 14.10	2.6787	20 28 40.2	5.183
17	15 26 25.84	2.4011	14 2 57.1	10.629	17	17 28 54.95	2.6829	20 33 46.6	5.031
18	15 28 50.10	2.4077	14 13 32.6	10.552	18	17 31 36.05	2.6870	20 38 43.9	4.878
19	15 31 14.76	2.4142	14 24 3.4	10.473	19	17 34 17.39	2.6908	20 43 32.0	4.724
20	15 33 39.81	2.4208	14 34 29.4	10.392	20	17 36 58.95	2.6946	20 48 10.8	4.568
21	15 36 5.26	2.4274	14 44 50.5	10.310	21	17 39 40.74	2.6982	20 52 40.2	4.412
22	15 38 31.10	2.4339	14 55 6.6	10.226	22	17 42 22.74	2.7018	20 57 0.2	4.254
23	15 40 57.33	2.4405	15 5 17.6	10.141	23	17 45 4.95	2.7051	21 1 10.7	4.096
24	15 43 23.96	2.4471	S. 15 15 23.5	10.054	24	17 47 47.35	2.7082	S. 21 5 11.7	3.937

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 25.					THURSDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	17 47 47.35	2.7082	S. 21 5 11.7	3.937	1	19 58 34.74	2.6808	S. 21 2 27.0	4.008
2	17 50 29.94	2.7114	21 9 3.1	3.776	2	20 1 15.46	2.6766	20 58 21.9	4.163
3	17 53 12.72	2.7144	21 12 44.8	3.614	3	20 3 55.93	2.6723	20 54 7.5	4.317
4	17 55 55.67	2.7172	21 16 16.8	3.452	4	20 6 36.14	2.6678	20 49 43.9	4.468
5	17 58 38.78	2.7198	21 19 39.1	3.290	5	20 9 16.07	2.6632	20 45 11.3	4.618
6	18 1 22.05	2.7223	21 22 51.6	3.127	6	20 11 55.72	2.6585	20 40 29.7	4.768
7	18 4 5.46	2.7247	21 25 54.3	2.962	7	20 14 35.09	2.6537	20 35 39.1	4.917
8	18 6 49.01	2.7268	21 28 47.1	2.797	8	20 17 14.16	2.6487	20 30 39.7	5.064
9	18 9 32.68	2.7289	21 31 30.0	2.632	9	20 19 52.93	2.6437	20 25 31.4	5.211
10	18 12 16.48	2.7309	21 34 2.9	2.465	10	20 22 31.40	2.6386	20 20 14.4	5.355
11	18 15 0.39	2.7326	21 36 25.8	2.298	11	20 25 9.56	2.6334	20 14 48.8	5.498
12	18 17 44.39	2.7342	21 38 38.7	2.132	12	20 27 47.41	2.6281	20 9 14.6	5.641
13	18 20 28.49	2.7357	21 40 41.6	1.964	13	20 30 24.93	2.6226	20 3 31.9	5.782
14	18 23 12.67	2.7369	21 42 34.4	1.796	14	20 33 2.12	2.6170	19 57 40.8	5.921
15	18 25 56.92	2.7380	21 44 17.1	1.627	15	20 35 38.97	2.6114	19 51 41.4	6.058
16	18 28 41.23	2.7389	21 45 49.7	1.458	16	20 38 15.49	2.6058	19 45 33.8	6.194
17	18 31 25.59	2.7397	21 47 12.1	1.289	17	20 40 51.67	2.6001	19 39 18.1	6.329
18	18 34 9.99	2.7403	21 48 24.4	1.120	18	20 43 27.50	2.5942	19 32 54.3	6.463
19	18 36 54.43	2.7408	21 49 26.5	0.951	19	20 46 2.97	2.5882	19 26 22.5	6.595
20	18 39 38.89	2.7411	21 50 18.5	0.781	20	20 48 38.09	2.5822	19 19 42.9	6.725
21	18 42 23.36	2.7412	21 51 0.2	0.611	21	20 51 12.84	2.5762	19 12 55.5	6.854
22	18 45 7.84	2.7412	21 51 31.8	0.442	22	20 53 47.23	2.5701	19 6 0.4	6.982
23	18 47 52.31	2.7411	21 51 53.2	0.272	23	20 56 21.25	2.5639	18 58 57.6	7.108
24	18 50 36.77	2.7407	S. 21 52 4.4	-0.102	24	20 58 54.90	2.5577	S. 18 51 47.4	7.232
WEDNESDAY 26.					FRIDAY 28.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	18 53 21.20	2.7402	S. 21 52 5.4	+0.068	1	21 1 28.17	2.5513	S. 18 44 29.8	7.354
2	18 56 5.59	2.7394	21 51 56.2	0.237	2	21 4 1.06	2.5450	18 37 4.9	7.476
3	18 58 49.93	2.7386	21 51 36.9	0.407	3	21 6 33.57	2.5387	18 29 32.7	7.596
4	19 1 34.22	2.7376	21 51 7.4	0.577	4	21 9 5.70	2.5322	18 21 53.4	7.713
5	19 4 18.44	2.7364	21 50 27.7	0.746	5	21 11 37.43	2.5257	18 14 7.1	7.829
6	19 7 2.59	2.7351	21 49 37.9	0.914	6	21 14 8.78	2.5192	18 6 13.9	7.944
7	19 9 46.65	2.7336	21 48 38.0	1.082	7	21 16 39.73	2.5126	17 58 13.8	8.057
8	19 12 30.62	2.7319	21 47 28.0	1.251	8	21 19 10.29	2.5060	17 50 7.0	8.169
9	19 15 14.48	2.7302	21 46 7.9	1.418	9	21 21 40.45	2.4993	17 41 53.5	8.279
10	19 17 58.24	2.7283	21 44 37.8	1.585	10	21 24 10.21	2.4927	17 33 33.5	8.387
11	19 20 41.87	2.7261	21 42 57.7	1.752	11	21 26 39.57	2.4860	17 25 7.0	8.494
12	19 23 25.37	2.7238	21 41 7.6	1.918	12	21 29 8.53	2.4793	17 16 34.2	8.598
13	19 26 8.73	2.7214	21 39 7.5	2.084	13	21 31 37.09	2.4726	17 7 55.2	8.702
14	19 28 51.94	2.7187	21 36 57.5	2.248	14	21 34 5.24	2.4658	16 59 10.0	8.803
15	19 31 34.98	2.7159	21 34 37.7	2.412	15	21 36 32.99	2.4591	16 50 18.8	8.902
16	19 34 17.85	2.7131	21 32 8.1	2.575	16	21 39 0.33	2.4523	16 41 21.7	9.001
17	19 37 0.55	2.7101	21 29 28.7	2.738	17	21 41 27.27	2.4456	16 32 18.7	9.098
18	19 39 43.06	2.7069	21 26 39.5	2.901	18	21 43 53.80	2.4387	16 23 9.9	9.193
19	19 42 25.38	2.7036	21 23 40.6	3.061	19	21 46 19.92	2.4319	16 13 55.5	9.287
20	19 45 7.49	2.7001	21 20 32.2	3.221	20	21 48 45.63	2.4252	16 4 35.5	9.378
21	19 47 49.39	2.6966	21 17 14.1	3.381	21	21 51 10.94	2.4184	15 55 10.1	9.468
22	19 50 31.08	2.6929	21 13 46.5	3.539	22	21 53 35.84	2.4116	15 45 39.3	9.557
23	19 53 12.54	2.6890	21 10 9.4	3.697	23	21 56 0.33	2.4048	15 36 3.3	9.643
24	19 55 53.76	2.6850	21 6 22.9	3.853	24	21 58 24.42	2.3981	15 26 22.1	9.728
	19 58 34.74	2.6808	S. 21 2 27.0	4.008		22 0 48.10	2.3912	S. 15 16 35.9	9.812



GREENWICH MEAN TIME.													
THE MOON'S RIGHT ASCENSION AND DECLINATION.													
Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 29.							MONDAY, JULY 1.						
0	h	m	s	s	°	'	0	h	m	s	s	°	'
1	22	3	11.37	2.3845	15	6	1	23	48	24.65	2.1111	S. 6	18
2	22	5	34.24	2.3778	14	56						39.0	12.064
3	22	7	56.71	2.3711	14	46							
4	22	10	18.77	2.3644	14	36							
5	22	12	40.44	2.3577	14	26							
6	22	15	1.70	2.3510	14	16							
7	22	17	22.56	2.3444	14	5							
8	22	19	43.03	2.3378	13	55							
9	22	22	3.10	2.3312	13	45							
10	22	24	22.78	2.3247	13	34							
11	22	26	42.06	2.3182	13	24							
12	22	29	0.96	2.3117	13	13							
13	22	31	19.47	2.3052	13	2							
14	22	33	37.59	2.2988	12	51							
15	22	35	55.33	2.2924	12	41							
16	22	38	12.68	2.2861	12	30							
17	22	40	29.66	2.2799	12	19							
18	22	42	46.27	2.2737	12	8							
19	22	45	2.50	2.2673	11	57							
20	22	47	18.35	2.2612	11	45							
21	22	49	33.84	2.2552	11	34							
22	22	51	48.97	2.2491	11	23							
23	22	54	3.73	2.2430	S. 11	12							
SUNDAY 30.							PHASES OF THE MOON.						
0	22	56	18.13	2.2371	S. 11	0	☾ Last Quarter . . . . . June	d	h	m	2	17	19.6
1	22	58	32.18	2.2312	10	49	☉ New Moon . . . . .	10	11	49.9			
2	23	0	45.87	2.2253	10	38	☽ First Quarter . . . . .	18	14	55.0			
3	23	2	59.21	2.2195	10	26	○ Full Moon . . . . .	25	9	27.0			
4	23	5	12.21	2.2137	10	15							
5	23	7	24.86	2.2080	10	3							
6	23	9	37.17	2.2024	9	52							
7	23	11	49.15	2.1968	9	40							
8	23	14	0.79	2.1913	9	28							
9	23	16	12.11	2.1858	9	17							
10	23	18	23.09	2.1804	9	5							
11	23	20	33.76	2.1751	8	53							
12	23	22	44.10	2.1697	8	41							
13	23	24	54.13	2.1645	8	30							
14	23	27	3.84	2.1593	8	18							
15	23	29	13.25	2.1543	8	6							
16	23	31	22.35	2.1492	7	54							
17	23	33	31.15	2.1442	7	42							
18	23	35	39.66	2.1393	7	30							
19	23	37	47.87	2.1344	7	18							
20	23	39	55.79	2.1296	7	6							
21	23	42	3.42	2.1248	6	54							
22	23	44	10.77	2.1202	6	42							
23	23	46	17.85	2.1157	6	30							
24	23	48	24.65	2.1111	S. 6	18							

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	Antares	W.	69 6 58	2346	70 51 50	2339	72 36 23	2373	74 20 36	2388
	MARS	W.	28 51 10	2339	30 36 13	2351	32 20 59	2363	34 5 27	2376
	SATURN	E.	38 32 36	2325	36 47 12	2341	35 2 12	2357	33 17 35	2373
	α Arietis	E.	79 13 21	2453	77 31 1	2470	75 49 4	2487	74 7 32	2505
	SUN	E.	112 8 16	2610	110 29 34	2625	108 51 13	2641	107 13 14	2657
2	Antares	W.	82 56 28	2462	84 38 35	2476	86 20 22	2491	88 1 48	2506
	α Aquilæ	W.	44 5 29	3910	45 18 39	3836	46 33 4	3772	47 48 35	3717
	MARS	W.	42 43 4	2443	44 25 37	2457	46 7 50	2471	47 49 44	2485
	α Arietis	E.	65 46 19	2601	64 7 25	2622	62 28 59	2643	60 51 2	2664
	SUN	E.	99 8 40	2737	97 32 50	2753	95 57 21	2769	94 22 14	2785
3	Antares	W.	96 23 45	2581	98 3 7	2596	99 42 8	2610	101 20 49	2625
	MARS	W.	56 14 23	2554	57 54 21	2568	59 34 0	2581	61 13 21	2591
	α Aquilæ	W.	54 18 42	3527	55 38 36	3503	56 58 57	3481	58 19 43	3463
	α Arietis	E.	52 48 50	2783	51 14 0	2809	49 39 44	2837	48 6 4	2866
	SUN	E.	86 31 47	2865	84 58 43	2880	83 25 59	2895	81 53 34	2911
4	Antares	W.	109 29 20	2696	111 6 5	2710	112 42 31	2725	114 18 38	2739
	MARS	W.	69 25 34	2659	71 3 9	2672	72 40 27	2684	74 17 29	2695
	α Aquilæ	W.	65 7 44	3406	66 29 54	3401	67 52 9	3397	69 14 30	3393
	SUN	E.	74 16 16	2983	72 45 43	2997	71 15 27	3011	69 45 29	3025
5	MARS	W.	82 18 44	2752	83 54 15	2763	85 29 31	2773	87 4 34	2784
	α Aquilæ	W.	76 6 37	3396	77 28 58	3399	78 51 16	3402	80 13 30	3407
	Fomalhaut	W.	40 59 14	3262	42 24 10	3242	43 49 29	3226	45 15 7	3212
	SATURN	W.	15 13 55	2818	16 48 0	2820	18 22 3	2823	19 56 1	2828
	SUN	E.	62 19 44	3090	60 51 22	3102	59 23 15	3114	57 55 23	3126
6	MARS	W.	94 56 31	2832	96 30 17	2841	98 3 52	2850	99 37 15	2858
	α Aquilæ	W.	87 3 3	3441	88 24 33	3449	89 45 54	3458	91 7 5	3468
	Fomalhaut	W.	52 26 39	3171	53 53 23	3167	55 20 12	3164	56 47 5	3162
	α Pegasi	W.	39 54 54	3880	41 8 34	3827	42 23 8	3779	43 38 33	3735
	SATURN	W.	27 43 52	2863	29 16 58	2871	30 49 54	2879	32 22 40	2886
	SUN	E.	50 39 31	3183	49 13 1	3193	47 46 43	3203	46 20 37	3213
7	MARS	W.	107 21 33	2898	108 53 54	2906	110 26 5	2913	111 58 7	2920
	α Aquilæ	W.	97 50 4	3525	99 10 0	3539	100 29 42	3553	101 49 8	3567
	Fomalhaut	W.	64 1 51	3160	65 28 48	3161	66 55 43	3163	68 22 37	3165
	α Pegasi	W.	50 5 30	3582	51 24 24	3561	52 43 41	3542	54 13 19	3523
	SATURN	W.	40 4 7	2924	41 35 56	2931	43 7 35	2938	44 39 6	2944
	SUN	E.	39 13 5	3262	37 48 9	3271	36 23 24	3280	34 58 49	3289
8	Fomalhaut	W.	75 36 21	3179	77 2 55	3183	78 29 25	3186	79 55 51	3190
	α Pegasi	W.	60 45 29	3466	62 6 31	3458	63 27 42	3451	64 49 1	3445
	SATURN	W.	52 14 36	2977	53 45 18	2982	55 15 53	2988	56 46 21	2994
	SUN	E.	27 58 35	3335	26 35 4	3345	25 11 45	3355	23 48 37	3366
12	SUN	W.	16 27 36	3505	17 47 55	3497	19 8 23	3491	20 28 58	3485
	Regulus	E.	51 49 7	3079	50 20 32	3080	48 51 58	3081	47 23 26	3082
	Spica	E.	105 43 35	3110	104 15 38	3110	102 47 41	3110	101 19 44	3110

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
1	Antares W. MARS W. SATURN E. α Arietis E. SUN E.	76 4 28 35 49 36 31 33 21 72 26 25 105 35 36	2403 2389 2389 2523 2673	77 47 59 37 33 26 29 49 31 70 45 44 103 58 20	2417 2402 2406 2542 2689	79 31 10 39 16 58 28 6 5 69 5 29 102 21 25	2432 2415 2424 2561 2705	81 14 0 41 0 11 26 23 5 67 25 40 100 44 52	2447 2429 2442 2581 2721
2	Antares W. α Aquilæ W. MARS W. α Arietis E. SUN E.	89 42 53 49 5 4 49 31 19 59 13 34 92 47 27	2521 3668 2499 2686 2801	91 23 37 50 22 25 51 12 34 57 36 36 91 13 1	2536 3685 2513 2709 2817	93 4 0 51 40 32 52 53 29 56 0 9 89 38 56	2551 3588 2526 2733 2833	94 44 3 52 59 19 54 34 6 54 24 13 88 5 11	2566 3555 2540 2758 2849
3	Antares W. MARS W. α Aquilæ W. α Arietis E. SUN E.	102 59 10 62 52 23 59 40 49 46 33 1 80 21 29	2640 2608 3447 2896 2926	104 37 11 64 31 7 61 2 13 45 0 37 78 49 43	2654 2621 3434 2927 2941	106 14 53 66 9 33 62 23 51 43 28 53 77 18 16	2668 2634 3423 2960 2955	107 52 16 67 47 42 63 45 42 41 57 51 75 47 7	2682 2646 3413 2996 2969
4	Antares W. MARS W. α Aquilæ W. SUN E.	115 54 26 75 54 15 70 36 54 68 15 47	2753 2707 3392 3039	117 29 56 77 30 45 71 59 20 66 46 22	2766 2719 3392 3052	119 5 8 79 6 59 73 21 46 65 17 14	2780 2730 3392 3065	120 40 2 80 42 59 74 44 12 63 48 21	2794 2741 3393 3078
5	MARS W. α Aquilæ W. Fomalhaut W. SATURN W. SUN E.	88 39 23 81 35 39 46 41 2 21 29 53 56 27 45	2794 3413 3200 2834 3138	90 13 59 82 57 41 48 7 11 23 3 37 55 0 21	2804 3419 3190 2841 3149	91 48 22 84 19 36 49 33 31 24 37 11 53 33 11	2813 3426 3182 2848 3160	93 22 33 85 41 24 51 0 1 26 10 36 52 6 14	2823 3433 3176 2855 3172
6	MARS W. α Aquilæ W. Fomalhaut W. α Pegasi W. SATURN W. SUN E.	101 10 28 92 28 5 58 14 0 44 54 44 33 55 17 44 54 43	2866 3478 3160 3696 2894 3223	102 43 30 93 48 53 59 40 57 46 11 35 35 27 44 43 29 1	2875 3488 3159 3662 2901 3233	104 16 21 95 9 30 61 7 55 47 29 2 37 0 1 42 3 31	2883 3500 3159 3632 2909 3243	105 49 2 96 29 54 62 34 53 48 47 2 38 32 9 40 38 12	2891 3513 3159 3606 2916 3253
7	MARS W. α Aquilæ W. Fomalhaut W. α Pegasi W. SATURN W. SUN E.	113 30 1 103 8 18 69 49 28 55 23 16 46 10 29 33 34 25	2927 3583 3168 3510 2951 3298	115 1 45 104 27 11 71 16 16 56 43 29 47 41 43 32 10 11	2934 3598 3170 3497 2958 3308	116 33 21 105 45 47 72 43 1 58 3 56 49 12 48 30 46 9	2940 3615 3173 3485 2964 3317	118 4 49 107 4 5 74 9 43 59 24 37 50 43 46 29 22 17	2946 3634 3176 3475 2970 3326
8	Fomalhaut W. α Pegasi W. SATURN W. SUN E.	81 22 12 66 10 27 58 16 41 22 25 41	3194 3440 3000 3377	82 48 28 67 31 59 59 46 54 21 2 58	3198 3436 3005 3389	84 14 39 68 53 35 61 17 1 19 40 29	3202 3432 3010 3401	85 40 45 70 15 15 62 47 1 18 18 14	3206 3429 3015 3413
12	SUN W. Regulus E. Spica E.	21 49 39 45 54 55 99 51 46	3480 3083 3110	23 10 26 44 26 25 98 23 49	3476 3084 3110	24 31 17 42 57 56 96 55 53	3472 3084 3110	25 52 12 41 29 27 95 27 56	3469 3085 3110

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
13	SUN	W.	27 13 11	3466	28 34 14	3463	29 55 20	3459	31 16 30	3456
	Regulus	E.	40 0 59	3085	38 32 31	3084	37 4 2	3084	35 35 33	3084
	Spica	E.	93 59 58	3109	92 31 59	3108	91 4 0	3107	89 35 59	3106
14	SUN	W.	38 3 14	3438	39 24 47	3434	40 46 25	3430	42 8 8	3425
	JUPITER	W.	14 45 8	3147	16 12 21	3143	17 39 38	3139	19 6 59	3135
	Regulus	E.	28 12 58	3080	26 44 24	3080	25 15 50	3079	23 47 15	3078
	Spica	E.	82 15 25	3096	80 47 11	3093	79 18 53	3090	77 50 32	3087
15	SUN	W.	48 58 6	3398	50 20 25	3392	51 42 51	3385	53 5 25	3378
	JUPITER	W.	26 25 14	3109	27 53 13	3104	29 21 18	3098	30 49 30	3091
	Spica	E.	70 27 43	3068	68 58 54	3063	67 29 59	3058	66 0 58	3053
	Antares	E.	116 20 47	3083	114 52 17	3077	113 23 39	3070	111 54 52	3063
16	SUN	W.	60 0 26	3336	61 23 55	3327	62 47 35	3317	64 11 27	3307
	JUPITER	W.	38 12 42	3053	39 41 49	3044	41 11 7	3035	42 40 36	3026
	Pollux	W.	32 21 16	3078	33 49 52	3062	35 18 48	3047	36 48 3	3031
	Spica	E.	58 34 12	3023	57 4 28	3016	55 34 36	3009	54 4 35	3002
	Antares	E.	104 28 38	3022	102 58 52	3013	101 28 56	3003	99 58 48	2993
17	SUN	W.	71 13 51	3250	72 39 1	3238	74 4 25	3225	75 30 4	3212
	JUPITER	W.	50 11 2	2974	51 41 47	2962	53 12 47	2950	54 44 3	2938
	Pollux	W.	44 18 58	2958	45 50 3	2943	47 21 27	2928	48 53 10	2914
	Spica	E.	46 32 14	2965	45 1 17	2958	43 30 11	2950	41 58 56	2943
	Antares	E.	92 24 58	2942	90 53 32	2930	89 21 51	2918	87 49 55	2906
18	SUN	W.	82 42 27	3139	84 9 49	3124	85 37 29	3108	87 5 29	3091
	JUPITER	W.	62 24 25	2870	63 57 22	2856	65 30 37	2841	67 4 12	2826
	Pollux	W.	56 36 27	2838	58 10 5	2822	59 44 4	2806	61 18 24	2790
	Regulus	W.	20 34 52	2827	22 8 45	2808	23 43 2	2791	25 17 42	2773
	Antares	E.	80 6 18	2842	78 32 44	2828	76 58 52	2814	75 24 42	2800
	MARS	E.	119 12 25	2759	117 37 3	2743	116 1 20	2728	114 25 17	2712
19	SUN	W.	94 30 34	3006	96 0 39	2988	97 31 7	2969	99 1 58	2950
	JUPITER	W.	74 57 10	2745	76 32 50	2728	78 8 52	2711	79 45 17	2693
	Pollux	W.	69 15 27	2706	70 51 58	2689	72 28 53	2671	74 6 12	2654
	Regulus	W.	33 16 51	2685	34 53 51	2667	36 31 15	2649	38 9 3	2631
	Antares	E.	67 29 8	2725	65 53 2	2710	64 16 35	2695	62 39 48	2679
	MARS	E.	106 19 44	2631	104 41 31	2614	103 2 55	2596	101 23 55	2579
20	SUN	W.	106 42 11	2855	108 15 28	2836	109 49 9	2816	111 23 16	2796
	JUPITER	W.	87 53 22	2603	89 32 13	2585	91 11 28	2566	92 51 9	2547
	Pollux	W.	82 18 48	2563	83 58 34	2545	85 38 45	2526	87 19 22	2507
	Regulus	W.	46 24 14	2540	48 4 32	2521	49 45 16	2502	51 26 26	2484
	Antares	E.	54 30 40	2601	52 51 47	2587	51 12 34	2572	49 33 1	2558
	MARS	E.	93 2 50	2489	91 21 21	2471	89 39 28	2453	87 57 8	2435
21	SUN	W.	119 20 24	2696	120 57 9	2677	122 34 20	2657	124 11 57	2638
	JUPITER	W.	101 16 8	2453	102 58 27	2435	104 41 12	2416	106 24 24	2398
	Pollux	W.	95 48 56	2415	97 32 9	2397	99 15 48	2379	100 59 53	2362
	Regulus	W.	59 58 52	2389	61 42 42	2371	63 26 58	2353	65 11 41	2335
	Antares	E.	41 10 30	2494	39 29 8	2484	37 47 33	2475	36 5 45	2468

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
13	SUN	W.	32 37 43	3453	33 59 0	3450	35 20 20	3446	36 41 45	3442
	Regulus	E.	34 7 4	3083	32 38 34	3082	31 10 3	3082	29 41 31	3081
	Spica	E.	88 7 56	3104	86 39 52	3102	85 11 45	3101	83 43 36	3099
14	SUN	W.	43 29 56	3420	44 51 49	3415	46 13 48	3409	47 35 54	3404
	JUPITER	W.	20 34 26	3130	22 1 58	3125	23 29 37	3120	24 57 22	3114
	Regulus	E.	22 18 39	3078	20 50 3	3079	19 21 27	3080	17 52 53	3082
	Spica	E.	76 22 7	3084	74 53 38	3081	73 25 5	3077	71 56 27	3072
15	SUN	W.	54 28 7	3370	55 50 57	3362	57 13 57	3353	58 37 7	3345
	JUPITER	W.	32 17 51	3084	33 46 20	3077	35 14 58	3069	36 43 45	3061
	Spica	E.	64 31 51	3047	63 2 37	3042	61 33 16	3036	60 3 48	3030
	Antares	E.	110 25 57	3056	108 56 53	3047	107 27 38	3039	105 58 13	3030
16	SUN	W.	65 35 30	3296	66 59 45	3285	68 24 14	3274	69 48 56	3262
	JUPITER	W.	44 10 16	3016	45 40 8	3006	47 10 13	2996	48 40 30	2985
	Pollux	W.	38 17 37	3016	39 47 30	3001	41 17 41	2987	42 48 10	2972
	Spica	E.	52 34 25	2995	51 4 6	2988	49 33 38	2981	48 3 1	2973
	Antares	E.	98 28 27	2984	96 57 54	2974	95 27 9	2963	93 56 10	2953
17	SUN	W.	76 55 59	3198	78 22 10	3184	79 48 38	3169	81 15 24	3154
	JUPITER	W.	56 15 34	2925	57 47 21	2912	59 19 25	2898	60 51 46	2884
	Pollux	W.	50 25 11	2899	51 57 31	2884	53 30 10	2869	55 3 9	2854
	Spica	E.	40 27 32	2936	38 55 59	2920	37 24 17	2903	35 52 27	2886
	Antares	E.	86 17 44	2894	84 45 17	2881	83 12 34	2868	81 39 34	2855
18	SUN	W.	88 33 49	3075	90 2 29	3058	91 31 29	3041	93 0 51	3024
	JUPITER	W.	68 38 6	2810	70 12 21	2795	71 46 56	2779	73 21 52	2762
	Pollux	W.	62 53 5	2774	64 28 7	2757	66 3 31	2740	67 39 18	2723
	Regulus	W.	26 52 45	2756	28 28 11	2738	30 4 1	2720	31 40 14	2702
	Antares	E.	73 50 14	2765	72 15 27	2770	70 40 20	2756	69 4 54	2741
	MARS	E.	112 48 53	2697	111 12 9	2681	109 35 3	2664	107 57 35	2647
19	SUN	W.	100 33 13	2932	102 4 51	2913	103 36 53	2894	105 9 19	2874
	JUPITER	W.	81 22 6	2675	82 59 18	2657	84 36 55	2639	86 14 56	2621
	Pollux	W.	75 43 54	2636	77 22 0	2618	79 0 31	2599	80 39 27	2581
	Regulus	W.	39 47 16	2613	41 25 53	2595	43 4 55	2577	44 44 22	2559
	Antares	E.	61 2 40	2664	59 25 11	2648	57 47 22	2632	56 9 11	2617
	MARS	E.	99 44 31	2561	98 4 43	2543	96 24 30	2526	94 43 53	2507
20	SUN	W.	112 57 50	2776	114 32 49	2756	116 8 14	2736	117 44 6	2716
	JUPITER	W.	94 31 17	2529	96 11 50	2510	97 52 50	2491	99 34 16	2472
	Pollux	W.	89 0 25	2489	90 41 53	2470	92 23 48	2452	94 6 9	2433
	Regulus	W.	53 8 2	2465	54 50 5	2446	56 32 34	2427	58 15 30	2408
	Antares	E.	47 53 8	2544	46 12 56	2530	44 32 25	2517	42 51 36	2505
	MARS	E.	86 14 23	2416	84 31 11	2398	82 47 33	2379	81 3 28	2361
21	SUN	W.	125 50 1	2618	127 28 31	2599	129 7 27	2580	130 46 49	2562
	JUPITER	W.	108 8 2	2380	109 52 6	2361	111 36 37	2343	113 21 34	2325
	Pollux	W.	102 44 23	2344	104 29 19	2326	106 14 41	2309	108 0 27	2292
	Regulus	W.	66 56 50	2316	68 42 26	2298	70 28 29	2280	72 14 58	2263
	Antares	E.	34 23 47	2463	32 41 42	2461	30 59 34	2462	29 17 27	2465

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
21	MARS E.	79 18 57	2342	77 33 59	2324	75 48 35	2306	74 2 44	2288
22	Pollux W.	109 46 38	2276	111 33 14	2260	113 20 13	2244	115 7 35	2229
	Regulus W.	74 1 52	2245	75 49 12	2228	77 36 58	2211	79 25 9	2194
	MARS E.	65 7 1	2202	63 18 36	2186	61 29 46	2170	59 40 33	2154
	Fomalhaut E.	110 26 3	2484	108 44 27	2460	107 2 18	2438	105 19 38	2418
23	Regulus W.	88 32 3	2119	90 22 34	2105	92 13 25	2092	94 4 37	2079
	Spica W.	35 7 11	2218	36 55 11	2196	38 43 45	2175	40 32 50	2156
	MARS E.	50 28 49	2085	48 37 26	2073	46 45 45	2062	44 53 46	2052
	Fomalhaut E.	96 39 23	2399	94 54 6	2314	93 8 27	2300	91 22 28	2287
	α Pegasi E.	111 55 46	2566	110 16 5	2543	108 35 51	2520	106 55 5	2499
	SATURN E.	120 11 52	2128	118 21 36	2115	116 30 59	2101	114 40 1	2088
24	Regulus W.	103 25 11	2025	105 18 6	2016	107 11 16	2008	109 4 38	2001
	Spica W.	49 44 49	2080	51 36 19	2068	53 28 8	2057	55 20 14	2047
	Fomalhaut E.	82 28 12	2237	80 40 40	2231	78 52 58	2225	77 5 8	2221
	α Pegasi E.	98 24 36	2416	96 41 24	2404	94 57 56	2394	93 14 12	2385
	SATURN E.	105 20 30	2032	103 27 46	2023	101 34 48	2015	99 41 37	2007
25	Spica W.	64 44 1	2012	66 37 16	2008	68 30 38	2005	70 24 5	2003
	Fomalhaut E.	68 5 6	2221	66 17 10	2226	64 29 21	2233	62 41 41	2241
	α Pegasi E.	84 33 7	2364	82 48 40	2364	81 4 13	2366	79 19 49	2370
	SATURN E.	90 13 8	1981	88 19 4	1978	86 24 55	1975	84 30 42	1974
26	Spica W.	79 51 42	2005	81 45 8	2008	83 38 30	2012	85 31 46	2017
	Antares W.	34 19 5	2107	36 9 54	2099	38 0 54	2094	39 52 3	2090
	Fomalhaut E.	53 47 20	2312	52 1 38	2333	50 16 27	2337	48 31 51	2386
	α Pegasi E.	70 40 4	2416	68 56 52	2431	67 14 1	2448	65 31 34	2468
	SATURN E.	74 59 32	1980	73 5 26	1983	71 11 25	1987	69 17 31	1992
	α Arietis E.	113 25 4	2148	111 35 18	2147	109 45 30	2147	107 55 43	2149
27	Spica W.	94 55 45	2053	96 47 56	2063	98 39 53	2073	100 31 34	2084
	Antares E.	49 8 28	2096	50 59 34	2101	52 50 33	2107	54 41 22	2114
	SATURN E.	59 50 24	2029	57 57 35	2039	56 5 2	2049	54 12 44	2059
	α Arietis E.	98 47 55	2172	96 58 46	2181	95 9 50	2190	93 21 8	2200
28	Antares W.	63 52 11	2165	65 41 32	2177	67 30 35	2189	69 19 19	2203
	MARS W.	26 51 10	2123	28 41 34	2128	30 31 51	2134	32 21 58	2141
	SATURN E.	44 55 44	2124	43 5 21	2138	41 15 19	2153	39 25 40	2168
	α Arietis E.	84 21 45	2264	82 34 52	2279	80 48 21	2294	79 2 13	2311
	Aldebaran E.	115 46 20	2111	113 55 37	2125	112 5 16	2139	110 15 17	2154
29	Antares W.	78 17 38	2278	80 4 9	2294	81 50 17	2311	83 36 1	2328
	MARS W.	41 29 8	2196	43 17 41	2210	45 5 54	2224	46 53 46	2239
	α Arietis E.	70 18 1	2406	68 34 35	2427	66 51 39	2449	65 9 14	2472
	Aldebaran E.	101 11 4	2233	99 23 26	2249	97 36 12	2266	95 49 23	2284
30	Antares W.	92 18 24	2416	94 1 36	2434	95 44 22	2452	97 26 43	2470
	MARS W.	55 47 28	2317	57 33 2	2333	59 18 13	2350	61 3 0	2366
	α Arietis E.	56 45 25	2596	55 6 25	2624	53 28 3	2653	51 50 20	2684
	Aldebaran E.	87 1 44	2372	85 17 30	2390	83 33 41	2408	81 50 18	2426

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
21	MARS E.	72 16 27	2270	70 29 44	2253	68 42 35	2236	66 55 1	2219
22	Pollux W.	116 55 20	2214	118 43 27	2200	120 31 55	2186	122 20 44	2172
	Regulus W.	81 13 45	2178	83 2 45	2163	84 52 8	2148	86 41 54	2133
	MARS E.	57 50 56	2139	56 0 56	2125	54 10 35	2111	52 19 52	2098
	Fomalhaut E.	103 36 29	2398	101 52 51	2380	100 8 47	2362	98 24 17	2345
23	Regulus W.	95 56 8	2067	97 47 58	2053	99 40 6	2044	101 32 31	2034
	Spica W.	42 22 24	2138	44 12 25	2122	46 2 50	2107	47 53 39	2093
	MARS E.	43 1 32	2042	41 9 3	2033	39 16 21	2026	37 23 28	2021
	Fomalhaut E.	89 36 9	2275	87 49 33	2264	86 2 40	2254	84 15 33	2245
	α Pegasi E.	105 13 50	2480	103 32 8	2462	101 50 0	2445	100 7 29	2430
	SATURN E.	112 48 43	2076	110 57 6	2064	109 5 11	2053	107 12 59	2042
24	Regulus W.	110 58 11	1994	112 51 55	1988	114 45 48	1983	116 39 49	1979
	Spica W.	57 12 35	2038	59 5 10	2030	60 57 57	2024	62 50 54	2018
	Fomalhaut E.	75 17 12	2218	73 29 12	2216	71 41 9	2216	69 53 6	2218
	α Pegasi E.	91 30 16	2378	89 46 9	2372	88 1 54	2368	86 17 32	2365
	SATURN E.	97 48 14	2001	95 54 41	1995	94 0 58	1989	92 7 7	1984
25	Spica W.	72 17 35	2002	74 11 7	2001	76 4 40	2002	77 58 12	2003
	Fomalhaut E.	60 54 14	2250	59 7 1	2262	57 20 5	2276	55 33 30	2293
	α Pegasi E.	77 35 31	2375	75 51 21	2382	74 7 21	2391	72 23 34	2402
	SATURN E.	82 36 27	1974	80 42 11	1974	78 47 56	1975	76 53 43	1977
26	Spica W.	87 24 54	2023	89 17 53	2029	91 10 42	2036	93 3 20	2044
	Antares W.	41 43 19	2087	43 34 38	2087	45 25 57	2088	47 17 15	2091
	Fomalhaut E.	46 47 56	2418	45 4 47	2454	43 22 29	2494	41 41 8	2540
	α Pegasi E.	63 49 36	2490	62 8 9	2514	60 27 15	2541	58 46 59	2571
	SATURN E.	67 23 45	1998	65 30 8	2005	63 36 42	2012	61 43 27	2020
	α Arietis E.	106 5 59	2152	104 16 18	2156	102 26 43	2160	100 37 15	2165
27	Spica W.	102 22 58	2096	104 14 4	2109	106 4 50	2122	107 55 16	2134
	Antares W.	56 32 0	2122	58 22 25	2131	60 12 36	2141	62 2 32	2153
	SATURN E.	52 20 42	2071	50 28 58	2084	48 37 34	2097	46 46 29	2110
	α Arietis E.	91 32 40	2211	89 44 29	2223	87 56 35	2235	86 9 0	2249
28	Antares W.	71 7 42	2217	72 55 44	2232	74 43 25	2247	76 30 43	2262
	MARS W.	34 11 54	2150	36 1 37	2160	37 51 4	2171	39 40 15	2183
	SATURN E.	37 36 24	2184	35 47 33	2201	33 59 7	2218	32 11 7	2236
	α Arietis E.	77 16 30	2328	75 31 12	2347	73 46 21	2366	72 1 57	2385
	Aldebaran E.	108 25 40	2169	106 36 26	2184	104 47 35	2200	102 59 7	2216
29	Antares W.	85 21 20	2345	87 6 14	2362	88 50 43	2380	90 34 46	2398
	MARS W.	48 41 16	2254	50 28 23	2269	52 15 8	2285	54 1 30	2301
	α Arietis E.	63 27 21	2495	61 46 1	2519	60 5 14	2544	58 25 2	2569
	Aldebaran E.	94 3 0	2302	92 17 3	2319	90 31 31	2337	88 46 25	2354
30	Antares W.	99 8 38	2489	100 50 7	2507	102 31 10	2526	104 11 47	2544
	MARS W.	62 47 23	2383	64 31 22	2400	66 14 56	2417	67 58 6	2433
	α Arietis E.	50 13 18	2715	48 36 57	2747	47 1 20	2781	45 26 27	2815
	Aldebaran E.	80 7 20	2444	78 24 48	2462	76 42 41	2480	75 1 0	2497

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ' "	"	' "	s	m s	s
Mon.	1	6 36 57.31	10.349	N.23 10 41.1	- 9.13	15 45.70	68.78	3 23.29	0.492
Tues.	2	6 41 5.59	10.339	23 6 49.6	10.15	15 45.68	68.75	3 34.98	0.482
Wed.	3	6 45 13.64	10.329	23 2 33.9	11.15	15 45.67	68.71	3 46.44	0.472
Thur.	4	6 49 21.43	10.318	22 57 54.0	- 12.15	15 45.66	68.67	3 57.64	0.461
Frid.	5	6 53 28.95	10.306	22 52 50.1	13.15	15 45.66	68.63	4 8.58	0.449
Sat.	6	6 57 36.16	10.293	22 47 22.3	14.15	15 45.66	68.58	4 19.20	0.436
SUN.	7	7 1 43.05	10.279	22 41 30.7	- 15.13	15 45.66	68.53	4 29.50	0.422
Mon.	8	7 5 49.59	10.264	22 35 15.5	16.11	15 45.67	68.48	4 39.46	0.407
Tues.	9	7 9 55.76	10.249	22 28 36.8	17.08	15 45.69	68.43	4 49.04	0.391
Wed.	10	7 14 1.54	10.232	22 21 34.8	- 18.05	15 45.72	68.37	4 58.24	0.375
Thur.	11	7 18 6.91	10.215	22 14 9.5	19.02	15 45.75	68.31	5 7.04	0.358
Frid.	12	7 22 11.85	10.196	22 6 21.3	19.98	15 45.79	68.25	5 15.40	0.339
Sat.	13	7 26 16.33	10.177	21 58 10.4	- 20.92	15 45.83	68.18	5 23.30	0.319
SUN.	14	7 30 20.35	10.158	21 49 36.8	21.86	15 45.87	68.12	5 30.73	0.299
Mon.	15	7 34 23.87	10.137	21 40 40.7	22.79	15 45.92	68.05	5 37.68	0.279
Tues.	16	7 38 26.89	10.115	21 31 22.5	- 23.71	15 45.98	67.98	5 44.13	0.258
Wed.	17	7 42 29.39	10.092	21 21 42.3	24.62	15 46.04	67.91	5 50.05	0.236
Thur.	18	7 46 31.35	10.069	21 11 40.4	25.52	15 46.10	67.84	5 55.45	0.213
Frid.	19	7 50 32.77	10.046	21 1 16.9	- 26.42	15 46.17	67.77	6 0.30	0.190
Sat.	20	7 54 33.63	10.023	20 50 32.0	27.30	15 46.24	67.69	6 4.59	0.167
SUN.	21	7 58 33.92	10.000	20 39 26.2	28.17	15 46.32	67.61	6 8.31	0.143
Mon.	22	8 2 33.64	9.976	20 27 59.4	- 29.04	15 46.40	67.53	6 11.46	0.119
Tues.	23	8 6 32.77	9.952	20 16 12.2	29.89	15 46.48	67.45	6 14.04	0.095
Wed.	24	8 10 31.32	9.927	20 4 4.6	30.73	15 46.57	67.37	6 16.03	0.071
Thur.	25	8 14 29.29	9.903	19 51 37.0	- 31.56	15 46.66	67.28	6 17.43	0.046
Frid.	26	8 18 26.68	9.879	19 38 49.5	32.38	15 46.75	67.20	6 18.26	0.022
Sat.	27	8 22 23.47	9.854	19 25 42.5	33.20	15 46.85	67.11	6 18.50	0.002
SUN.	28	8 26 19.68	9.830	19 12 16.1	- 34.00	15 46.95	67.03	6 18.16	0.026
Mon.	29	8 30 15.31	9.806	18 58 30.7	34.79	15 47.05	66.94	6 17.23	0.051
Tues.	30	8 34 10.35	9.781	18 44 26.5	35.56	15 47.15	66.86	6 15.73	0.075
Wed.	31	8 38 4.82	9.757	18 30 3.7	36.33	15 47.26	66.77	6 13.65	0.099
Thur.	32	8 41 58.69	9.733	N.18 15 22.8	- 37.08	15 47.37	66.69	6 10.97	0.124

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0°.19 from the sidereal time.  
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.



## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
Mon.	1	<sup>h</sup> 6 <sup>m</sup> 36 <sup>s</sup> 56.72	10.348	N.23 10 41.7	- 9.13	<sup>m</sup> 3 23.26	0.492	<sup>h</sup> 6 <sup>m</sup> 33 33.46
Tues.	2	6 41 4.97	10.338	23 6 50.3	10.15	3 34.95	0.482	6 37 30.02
Wed.	3	6 45 12.99	10.328	23 2 34.7	11.15	3 46.41	0.472	6 41 26.58
Thur.	4	6 49 20.75	10.317	22 57 54.9	-12.15	3 57.61	0.461	6 45 23.14
Frid.	5	6 53 28.24	10.305	22 52 51.1	13.15	4 8.55	0.449	6 49 19.69
Sat.	6	6 57 35.42	10.292	22 47 23.4	14.15	4 19.17	0.436	6 53 16.25
SUN.	7	7 1 42.28	10.278	22 41 31.9	-15.13	4 29.47	0.422	6 57 12.81
Mon.	8	7 5 48.79	10.263	22 35 16.8	16.11	4 39.43	0.407	7 1 9.36
Tues.	9	7 9 54.93	10.248	22 28 38.2	17.09	4 49.01	0.391	7 5 5.92
Wed.	10	7 14 0.69	10.231	22 21 36.3	-18.06	4 58.21	0.375	7 9 2.48
Thur.	11	7 18 6.04	10.214	22 14 11.2	19.02	5 7.01	0.358	7 12 59.03
Frid.	12	7 22 10.96	10.195	22 6 23.1	19.98	5 15.37	0.339	7 16 55.59
Sat.	13	7 26 15.42	10.176	21 58 12.3	-20.92	5 23.27	0.319	7 20 52.15
SUN.	14	7 30 19.42	10.157	21 49 38.8	21.86	5 30.72	0.299	7 24 48.70
Mon.	15	7 34 22.92	10.136	21 40 42.9	22.79	5 37.66	0.279	7 28 45.26
Tues.	16	7 38 25.93	10.114	21 31 24.8	-23.71	5 44.11	0.258	7 32 41.82
Wed.	17	7 42 28.41	10.092	21 21 44.7	24.62	5 50.03	0.236	7 36 38.38
Thur.	18	7 46 30.36	10.069	21 11 42.9	25.52	5 55.43	0.213	7 40 34.93
Frid.	19	7 50 31.77	10.046	21 1 19.5	-26.42	6 0.29	0.190	7 44 31.49
Sat.	20	7 54 32.62	10.023	20 50 34.8	27.30	6 4.58	0.167	7 48 28.04
SUN.	21	7 58 32.90	10.000	20 39 29.1	28.17	6 8.30	0.143	7 52 24.60
Mon.	22	8 2 32.61	9.976	20 28 2.5	-29.04	6 11.45	0.119	7 56 21.16
Tues.	23	8 6 31.74	9.952	20 16 15.4	29.89	6 14.03	0.095	8 0 17.71
Wed.	24	8 10 30.29	9.927	20 4 7.9	30.73	6 16.02	0.071	8 4 14.27
Thur.	25	8 14 28.25	9.903	19 51 40.4	-31.57	6 17.43	0.046	8 8 10.82
Frid.	26	8 18 25.64	9.879	19 38 53.0	32.39	6 18.26	0.022	8 12 7.38
Sat.	27	8 22 22.44	9.855	19 25 46.0	33.20	6 18.50	0.002	8 16 3.94
SUN.	28	8 26 18.65	9.830	19 12 19.7	-34.00	6 18.16	0.026	8 20 0.49
Mon.	29	8 30 14.29	9.806	18 58 34.4	34.79	6 17.24	0.051	8 23 57.05
Tues.	30	8 34 9.34	9.782	18 44 30.2	35.56	6 15.74	0.075	8 27 53.60
Wed.	31	8 38 3.82	9.757	18 30 7.5	36.33	6 13.66	0.099	8 31 50.16
Thur.	32	8 41 57.70	9.733	N.18 15 26.6	-37.08	6 10.98	0.124	8 35 46.72

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,  
+9<sup>s</sup>.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	182	98 29 26.4	29 17.0	142.99	— 0.54	0.007 1975	+ 3.7	h m s 17 23 35.10
2	183	99 26 38.2	26 28.7	143.00	0.61	0.007 2055	2.9	17 19 39.19
3	184	100 23 50.2	23 40.6	143.01	0.64	0.007 2114	2.0	17 15 43.28
4	185	101 21 2.6	20 52.7	143.02	— 0.65	0.007 2152	+ 1.1	17 11 47.37
5	186	102 18 15.1	18 5.1	143.03	0.62	0.007 2168	+ 0.1	17 7 51.46
6	187	103 15 28.0	15 17.8	143.04	0.56	0.007 2159	— 0.9	17 3 55.55
7	188	104 12 41.0	12 30.7	143.05	— 0.49	0.007 2126	— 1.9	16 59 59.64
8	189	105 9 54.4	9 43.8	143.06	0.40	0.007 2069	2.9	16 56 3.72
9	190	106 7 7.9	6 57.2	143.07	0.29	0.007 1986	3.9	16 52 7.81
10	191	107 4 21.6	4 10.8	143.08	— 0.16	0.007 1878	— 5.0	16 48 11.90
11	192	108 1 35.6	1 24.5	143.09	— 0.02	0.007 1744	6.1	16 44 15.99
12	193	108 58 49.7	58 38.5	143.09	+ 0.08	0.007 1584	7.2	16 40 20.08
13	194	109 56 4.0	55 52.6	143.10	+ 0.19	0.007 1400	— 8.2	16 36 24.17
14	195	110 53 18.4	53 6.9	143.10	0.30	0.007 1191	9.2	16 32 28.26
15	196	111 50 33.0	50 21.3	143.11	0.39	0.007 0957	10.2	16 28 32.35
16	197	112 47 47.7	47 35.9	143.11	+ 0.43	0.007 0699	— 11.2	16 24 36.44
17	198	113 45 2.6	44 50.6	143.12	0.46	0.007 0419	12.1	16 20 40.52
18	199	114 42 17.6	42 5.4	143.13	0.46	0.007 0118	13.0	16 16 44.61
19	200	115 39 32.7	39 20.4	143.13	+ 0.43	0.006 9797	— 13.8	16 12 48.70
20	201	116 36 48.0	36 35.5	143.14	0.35	0.006 9457	14.5	16 8 52.79
21	202	117 34 3.5	33 50.9	143.15	0.27	0.006 9100	15.2	16 4 56.88
22	203	118 31 19.3	31 6.6	143.17	+ 0.14	0.006 8728	— 15.8	16 1 0.97
23	204	119 28 35.6	28 22.6	143.19	+ 0.01	0.006 8341	16.4	15 57 5.06
24	205	120 25 52.2	25 39.1	143.21	— 0.15	0.006 7941	16.9	15 53 9.15
25	206	121 23 9.5	22 56.2	143.23	— 0.30	0.006 7528	— 17.5	15 49 13.24
26	207	122 20 27.4	20 14.0	143.26	0.42	0.006 7103	18.0	15 45 17.33
27	208	123 17 46.1	17 32.6	143.30	0.54	0.006 6665	18.5	15 41 21.42
28	209	124 15 5.7	14 52.1	143.34	— 0.65	0.006 6213	— 19.1	15 37 25.51
29	210	125 12 26.3	12 12.5	143.38	0.72	0.006 5747	19.7	15 33 29.60
30	211	126 9 48.0	9 34.0	143.43	0.77	0.006 5266	20.4	15 29 33.69
31	212	127 7 10.7	6 56.6	143.47	0.78	0.006 4768	21.1	15 25 37.78
32	213	128 4 34.6	4 20.4	143.52	— 0.76	0.006 4252	— 21.9	15 21 41.87

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,  
— 9'.8296.  
(Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	THE MOON'S								
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
1	15 47.7	15 40.3	57 52.2	- 2.29	57 25.0	- 2.22	17 48.8	1.94	20.5
2	15 33.2	15 26.5	56 59.0	2.12	56 34.2	2.00	18 34.5	1.87	21.5
3	15 20.2	15 14.4	56 11.1	1.85	55 49.7	1.70	19 19.1	1.85	22.5
4	15 9.1	15 4.3	55 30.2	- 1.55	55 12.7	- 1.38	20 3.5	1.86	23.5
5	15 0.0	14 56.3	54 57.1	1.22	54 43.4	1.06	20 48.5	1.89	24.5
6	14 53.1	14 50.4	54 31.7	0.90	54 21.7	0.75	21 34.4	1.94	25.5
7	14 48.2	14 46.4	54 13.6	- 0.61	54 7.1	- 0.48	22 21.5	1.99	26.5
8	14 45.1	14 44.2	54 2.2	0.34	53 58.8	- 0.22	23 9.6	2.02	27.5
9	14 43.7	14 43.5	53 56.9	- 0.10	53 56.4	+ 0.01	23 58.2	2.03	28.5
10	14 43.7	14 44.3	53 57.3	+ 0.13	53 59.5	+ 0.24	6 . .	. .	29.5
11	14 45.3	14 46.7	54 3.0	0.35	54 7.9	0.46	0 46.7	2.01	0.9
12	14 48.3	14 50.4	54 14.1	0.58	54 21.7	0.69	1 34.5	1.97	1.9
13	14 52.9	14 55.7	54 30.7	+ 0.81	54 41.2	+ 0.94	2 21.2	1.92	2.9
14	14 59.0	15 2.7	54 53.3	1.06	55 6.9	1.20	3 6.9	1.88	3.9
15	15 6.9	15 11.5	55 22.2	1.35	55 39.1	1.48	3 51.7	1.86	4.9
16	15 16.5	15 22.0	55 57.7	+ 1.61	56 17.8	+ 1.75	4 36.3	1.86	5.9
17	15 28.0	15 34.3	56 39.6	1.87	57 2.7	1.98	5 21.5	1.90	6.9
18	15 40.9	15 47.7	57 27.0	2.07	57 52.3	2.13	6 8.2	1.99	7.9
19	15 54.8	16 1.9	58 18.2	+ 2.17	58 44.3	+ 2.16	6 57.4	2.12	8.9
20	16 8.9	16 15.8	59 10.1	2.12	59 35.2	2.03	7 50.1	2.28	9.9
21	16 22.2	16 28.0	59 58.7	1.88	60 20.2	1.68	8 47.0	2.46	10.9
22	16 33.1	16 37.3	60 39.0	+ 1.42	60 54.3	+ 1.12	9 47.9	2.61	11.9
23	16 40.4	16 42.4	61 5.8	+ 0.77	61 12.9	+ 0.39	10 51.4	2.67	12.9
24	16 43.0	16 42.3	61 15.3	- 0.02	61 12.8	- 0.41	11 55.4	2.64	13.9
25	16 40.4	16 37.1	61 5.5	- 0.80	60 53.6	- 1.17	12 57.5	2.53	14.9
26	16 32.7	16 27.3	60 37.4	1.50	60 17.5	1.79	13 56.0	2.37	15.9
27	16 21.0	16 14.1	59 54.4	2.02	59 29.0	2.20	14 50.3	2.20	16.9
28	16 6.6	15 59.0	59 1.6	- 2.32	58 33.3	- 2.38	15 41.1	2.05	17.9
29	15 51.1	15 43.3	58 4.6	2.38	57 36.0	2.35	16 29.0	1.95	18.9
30	15 35.7	15 28.5	57 8.2	2.27	56 41.6	2.16	17 15.1	1.90	19.9
31	15 21.6	15 15.3	56 16.4	2.02	55 53.1	1.86	18 0.4	1.88	20.9
32	15 9.5	15 4.3	55 31.8	- 1.68	55 12.7	- 1.50	18 45.7	1.90	21.9

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 1.					WEDNESDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	23 48 24.65	2.1111	S. 6 18 39.0	12.064	0	1 25 48.14	1.9723	N. 3 19 56.5	11.703
1	23 50 31.18	2.1067	6 6 34.7	12.079	1	1 27 46.44	1.9711	3 31 37.9	11.676
2	23 52 37.45	2.1022	5 54 29.5	12.092	2	1 29 44.67	1.9698	3 43 17.6	11.647
3	23 54 43.45	2.0979	5 42 23.6	12.105	3	1 31 42.82	1.9686	3 54 55.5	11.617
4	23 56 49.20	2.0937	5 30 16.9	12.117	4	1 33 40.90	1.9675	4 6 31.7	11.588
5	23 58 54.70	2.0895	5 18 9.5	12.128	5	1 35 38.92	1.9665	4 18 6.1	11.557
6	0 0 59.94	2.0853	5 6 1.5	12.137	6	1 37 36.88	1.9655	4 29 38.6	11.527
7	0 3 4.94	2.0812	4 53 53.0	12.145	7	1 39 34.78	1.9645	4 41 9.3	11.495
8	0 5 9.69	2.0772	4 41 44.1	12.152	8	1 41 32.62	1.9636	4 52 38.0	11.468
9	0 7 14.21	2.0734	4 29 34.7	12.160	9	1 43 30.41	1.9627	5 4 4.7	11.428
10	0 9 18.50	2.0695	4 17 24.9	12.165	10	1 45 28.15	1.9619	5 15 29.4	11.395
11	0 11 22.55	2.0657	4 5 14.9	12.169	11	1 47 25.84	1.9612	5 26 52.1	11.361
12	0 13 26.38	2.0620	3 53 4.6	12.173	12	1 49 23.50	1.9607	5 38 12.7	11.326
13	0 15 29.99	2.0583	3 40 54.1	12.175	13	1 51 21.12	1.9600	5 49 31.2	11.290
14	0 17 33.38	2.0547	3 28 43.6	12.176	14	1 53 18.70	1.9594	6 0 47.5	11.252
15	0 19 36.56	2.0512	3 16 33.0	12.177	15	1 55 16.25	1.9589	6 12 1.5	11.215
16	0 21 39.53	2.0477	3 4 22.4	12.177	16	1 57 13.77	1.9585	6 23 13.3	11.178
17	0 23 42.29	2.0443	2 52 11.8	12.176	17	1 59 11.27	1.9582	6 34 22.9	11.140
18	0 25 44.85	2.0411	2 40 1.3	12.172	18	2 1 8.75	1.9578	6 45 30.1	11.100
19	0 27 47.22	2.0378	2 27 51.1	12.168	19	2 3 6.21	1.9575	6 56 34.9	11.060
20	0 29 49.39	2.0346	2 15 41.1	12.165	20	2 5 3.65	1.9573	7 7 37.3	11.020
21	0 31 51.37	2.0315	2 3 31.3	12.160	21	2 7 1.08	1.9571	7 18 37.3	10.979
22	0 33 53.17	2.0285	1 51 21.9	12.153	22	2 8 58.50	1.9570	7 29 34.8	10.937
23	0 35 54.79	2.0255	S. 1 39 12.9	12.147	23	2 10 55.92	1.9569	N. 7 40 29.7	10.894
TUESDAY 2.					THURSDAY 4.				
0	0 37 56.23	2.0226	S. 1 27 4.3	12.139	0	2 12 53.33	1.9568	N. 7 51 22.1	10.852
1	0 39 57.50	2.0197	1 14 56.2	12.130	1	2 14 50.74	1.9569	8 2 11.9	10.808
2	0 41 58.60	2.0170	1 2 48.7	12.120	2	2 16 48.16	1.9570	8 12 59.0	10.763
3	0 43 59.54	2.0142	0 50 41.8	12.110	3	2 18 45.58	1.9571	8 23 43.5	10.718
4	0 46 0.31	2.0116	0 38 35.5	12.098	4	2 20 43.01	1.9572	8 34 25.2	10.672
5	0 48 0.93	2.0091	0 26 30.0	12.086	5	2 22 40.45	1.9575	8 45 4.2	10.627
6	0 50 1.40	2.0066	0 14 25.2	12.073	6	2 24 37.91	1.9578	8 55 40.4	10.580
7	0 52 1.72	2.0041	S. 0 2 21.2	12.060	7	2 26 35.39	1.9581	9 6 13.8	10.533
8	0 54 1.89	2.0017	N. 0 9 42.0	12.045	8	2 28 32.88	1.9584	9 16 44.4	10.485
9	0 56 1.92	1.9994	0 21 44.2	12.028	9	2 30 30.40	1.9588	9 27 12.0	10.436
10	0 58 1.82	1.9972	0 33 45.4	12.012	10	2 32 27.94	1.9592	9 37 36.7	10.387
11	1 0 1.58	1.9949	0 45 45.7	11.996	11	2 34 25.51	1.9598	9 47 58.4	10.337
12	1 2 1.21	1.9928	0 57 44.9	11.977	12	2 36 23.12	1.9604	9 58 17.1	10.287
13	1 4 0.72	1.9908	1 9 43.0	11.959	13	2 38 20.76	1.9609	10 8 32.8	10.236
14	1 6 0.11	1.9888	1 21 40.0	11.940	14	2 40 18.43	1.9615	10 18 45.4	10.183
15	1 7 59.38	1.9868	1 33 35.8	11.919	15	2 42 16.14	1.9622	10 28 54.8	10.131
16	1 9 58.53	1.9850	1 45 30.3	11.897	16	2 44 13.89	1.9629	10 39 1.1	10.079
17	1 11 57.58	1.9832	1 57 23.5	11.876	17	2 46 11.69	1.9637	10 49 4.3	10.026
18	1 13 56.52	1.9815	2 9 15.4	11.854	18	2 48 9.53	1.9644	10 59 4.2	9.971
19	1 15 55.36	1.9798	2 21 6.0	11.831	19	2 50 7.42	1.9652	11 9 0.8	9.916
20	1 17 54.10	1.9782	2 32 55.1	11.807	20	2 52 5.36	1.9662	11 18 54.1	9.862
21	1 19 52.74	1.9766	2 44 42.8	11.782	21	2 54 3.36	1.9671	11 28 44.2	9.807
22	1 21 51.29	1.9752	2 56 28.9	11.756	22	2 56 1.41	1.9679	11 38 30.9	9.749
23	1 23 49.76	1.9737	3 8 13.5	11.730	23	2 57 59.51	1.9689	11 48 14.1	9.692
24	1 25 48.14	1.9723	N. 3 19 56.5	11.703	24	2 59 57.68	1.9700	N. 11 57 53.9	9.635

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 5.					SUNDAY 7.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
0	2 59 57.68	1.9700	N. 11 57 53.9	9.636	0	4 36 12.17	2.0467	N. 18 23 17.9	6.215
1	3 1 55.91	1.9710	12 7 30.3	9.577	1	4 38 15.03	2.0486	18 29 28.3	6.131
2	3 3 54.20	1.9721	12 17 3.1	9.517	2	4 40 18.00	2.0504	18 35 33.6	6.046
3	3 5 52.56	1.9732	12 26 32.4	9.458	3	4 42 21.08	2.0522	18 41 33.8	5.961
4	3 7 50.99	1.9744	12 35 58.1	9.398	4	4 44 24.27	2.0541	18 47 28.9	5.875
5	3 9 49.49	1.9756	12 45 20.2	9.338	5	4 46 27.57	2.0559	18 53 18.8	5.789
6	3 11 48.06	1.9767	12 54 38.7	9.277	6	4 48 30.98	2.0577	18 59 3.6	5.703
7	3 13 46.70	1.9780	13 3 53.5	9.216	7	4 50 34.50	2.0596	19 4 43.2	5.616
8	3 15 45.42	1.9793	13 13 4.6	9.153	8	4 52 38.13	2.0614	19 10 17.5	5.528
9	3 17 44.22	1.9807	13 22 11.9	9.091	9	4 54 41.87	2.0632	19 15 46.6	5.441
10	3 19 43.10	1.9820	13 31 15.5	9.027	10	4 56 45.71	2.0649	19 21 10.4	5.352
11	3 21 42.06	1.9833	13 40 15.2	8.963	11	4 58 49.66	2.0667	19 26 28.9	5.264
12	3 23 41.10	1.9847	13 49 11.1	8.899	12	5 0 53.72	2.0685	19 31 42.1	5.175
13	3 25 40.23	1.9862	13 58 3.1	8.834	13	5 2 57.88	2.0702	19 36 49.9	5.086
14	3 27 39.44	1.9875	14 6 51.2	8.768	14	5 5 2.15	2.0720	19 41 52.4	4.996
15	3 29 38.73	1.9890	14 15 35.3	8.702	15	5 7 6.52	2.0737	19 46 49.4	4.905
16	3 31 38.12	1.9906	14 24 15.4	8.635	16	5 9 10.99	2.0754	19 51 41.0	4.814
17	3 33 37.60	1.9921	14 32 51.5	8.568	17	5 11 15.57	2.0772	19 56 27.1	4.723
18	3 35 37.17	1.9937	14 41 23.6	8.501	18	5 13 20.25	2.0788	20 1 7.8	4.632
19	3 37 36.84	1.9952	14 49 51.6	8.432	19	5 15 25.02	2.0803	20 5 43.0	4.540
20	3 39 36.60	1.9968	14 58 15.4	8.362	20	5 17 29.89	2.0820	20 10 12.6	4.447
21	3 41 36.46	1.9984	15 6 35.1	8.293	21	5 19 34.86	2.0836	20 14 36.7	4.355
22	3 43 36.41	2.0000	15 14 50.6	8.223	22	5 21 39.92	2.0852	20 18 55.2	4.262
23	3 45 36.46	2.0017	N. 15 23 1.9	8.152	23	5 23 45.08	2.0868	N. 20 23 8.1	4.168
SATURDAY 6.					MONDAY 8.				
0	3 47 36.61	2.0033	N. 15 31 8.9	8.082	0	5 25 50.34	2.0884	N. 20 27 15.4	4.074
1	3 49 36.86	2.0050	15 39 11.7	8.010	1	5 27 55.69	2.0903	20 31 17.0	3.980
2	3 51 37.21	2.0067	15 47 10.1	7.937	2	5 30 1.12	2.0913	20 35 13.0	3.886
3	3 53 37.67	2.0085	15 55 4.1	7.864	3	5 32 6.65	2.0929	20 39 3.3	3.791
4	3 55 38.23	2.0102	16 2 53.8	7.792	4	5 34 12.27	2.0943	20 42 47.9	3.696
5	3 57 38.90	2.0120	16 10 39.1	7.718	5	5 36 17.97	2.0957	20 46 26.8	3.600
6	3 59 39.67	2.0137	16 18 19.9	7.642	6	5 38 23.75	2.0971	20 49 59.9	3.504
7	4 1 40.55	2.0155	16 25 56.2	7.567	7	5 40 29.62	2.0985	20 53 27.3	3.408
8	4 3 41.53	2.0172	16 33 28.0	7.492	8	5 42 35.57	2.0998	20 56 48.9	3.312
9	4 5 42.62	2.0191	16 40 55.3	7.417	9	5 44 41.60	2.1011	21 0 4.7	3.215
10	4 7 43.82	2.0209	16 48 18.0	7.340	10	5 46 47.70	2.1023	21 3 14.7	3.117
11	4 9 45.13	2.0227	16 55 36.1	7.263	11	5 48 53.88	2.1037	21 6 18.8	3.020
12	4 11 46.54	2.0244	17 2 49.6	7.186	12	5 51 0.14	2.1049	21 9 17.1	2.923
13	4 13 48.06	2.0263	17 9 58.4	7.107	13	5 53 6.47	2.1061	21 12 9.6	2.825
14	4 15 49.70	2.0282	17 17 2.5	7.028	14	5 55 12.87	2.1072	21 14 56.1	2.726
15	4 17 51.45	2.0301	17 24 1.8	6.949	15	5 57 19.34	2.1083	21 17 36.7	2.627
16	4 19 53.31	2.0319	17 30 56.4	6.870	16	5 59 25.87	2.1094	21 20 11.4	2.529
17	4 21 55.28	2.0337	17 37 46.2	6.789	17	6 1 32.47	2.1105	21 22 40.2	2.431
18	4 23 57.36	2.0356	17 44 31.1	6.708	18	6 3 39.13	2.1116	21 25 3.1	2.332
19	4 25 59.55	2.0374	17 51 11.2	6.628	19	6 5 45.86	2.1126	21 27 20.0	2.232
20	4 28 1.85	2.0392	17 57 46.5	6.547	20	6 7 52.64	2.1134	21 29 30.9	2.132
21	4 30 4.26	2.0411	18 4 16.8	6.463	21	6 9 59.47	2.1143	21 31 35.9	2.033
22	4 32 6.78	2.0430	18 10 42.1	6.381	22	6 12 6.36	2.1153	21 33 34.9	1.932
23	4 34 9.42	2.0449	18 17 2.5	6.298	23	6 14 13.31	2.1162	21 35 27.8	1.832
24	4 36 12.17	2.0467	N. 18 23 17.9	6.215	24	6 16 20.30	2.1169	N. 21 37 14.7	1.732

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 9.					THURSDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	6 16 20.30	2.1169	N. 21 37 14.7	1.732	0	7 58 7.77	2.1091	N. 21 3 29.5	3.119
1	6 18 27.34	2.1177	21 38 55.6	1.632	1	8 0 14.28	2.1080	21 0 19.4	3.217
2	6 20 34.42	2.1184	21 40 30.5	1.531	2	8 2 20.73	2.1069	20 57 3.4	3.316
3	6 22 41.55	2.1192	21 41 59.3	1.429	3	8 4 27.11	2.1057	20 53 41.5	3.413
4	6 24 48.72	2.1198	21 43 22.0	1.328	4	8 6 33.42	2.1046	20 50 13.8	3.511
5	6 26 55.93	2.1204	21 44 38.7	1.228	5	8 8 39.66	2.1033	20 46 40.2	3.607
6	6 29 3.17	2.1209	21 45 49.3	1.126	6	8 10 45.82	2.1021	20 43 0.9	3.703
7	6 31 10.44	2.1215	21 46 53.8	1.025	7	8 12 51.91	2.1008	20 39 15.8	3.800
8	6 33 17.75	2.1221	21 47 52.3	0.924	8	8 14 57.92	2.0995	20 35 24.9	3.897
9	6 35 25.09	2.1225	21 48 44.7	0.822	9	8 17 3.85	2.0982	20 31 28.2	3.992
10	6 37 32.45	2.1228	21 49 30.9	0.719	10	8 19 9.70	2.0968	20 27 25.8	4.087
11	6 39 39.83	2.1233	21 50 11.0	0.618	11	8 21 15.47	2.0954	20 23 17.7	4.182
12	6 41 47.24	2.1237	21 50 45.1	0.517	12	8 23 21.15	2.0940	20 19 4.0	4.276
13	6 43 54.67	2.1239	21 51 13.0	0.414	13	8 25 26.75	2.0926	20 14 44.6	4.371
14	6 46 2.11	2.1242	21 51 34.8	0.312	14	8 27 32.26	2.0911	20 10 19.5	4.465
15	6 48 9.57	2.1244	21 51 50.5	0.211	15	8 29 37.68	2.0897	20 5 48.8	4.558
16	6 50 17.04	2.1246	21 52 0.1	0.109	16	8 31 43.02	2.0882	20 1 12.5	4.652
17	6 52 24.52	2.1247	21 52 3.6	+0.007	17	8 33 48.26	2.0866	19 56 30.6	4.744
18	6 54 32.01	2.1248	21 52 0.9	-0.096	18	8 35 53.41	2.0851	19 51 43.2	4.837
19	6 56 39.50	2.1248	21 51 52.1	0.197	19	8 37 58.47	2.0835	19 46 50.2	4.929
20	6 58 46.99	2.1248	21 51 37.2	0.299	20	8 40 3.43	2.0819	19 41 51.7	5.020
21	7 0 54.48	2.1248	21 51 16.2	0.402	21	8 42 8.30	2.0803	19 36 47.8	5.111
22	7 3 1.97	2.1247	21 50 49.0	0.504	22	8 44 13.07	2.0787	19 31 38.4	5.202
23	7 5 9.45	2.1247	N. 21 50 15.7	0.606	23	8 46 17.74	2.0770	N. 19 26 23.6	5.292
WEDNESDAY 10.					FRIDAY 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	7 7 16.93	2.1246	N. 21 49 36.3	0.707	0	8 48 22.31	2.0753	N. 19 21 3.3	5.382
1	7 9 24.40	2.1243	21 48 50.8	0.810	1	8 50 26.78	2.0737	19 15 37.7	5.472
2	7 11 31.85	2.1241	21 47 59.1	0.912	2	8 52 31.16	2.0721	19 10 6.7	5.562
3	7 13 39.29	2.1238	21 47 1.4	1.013	3	8 54 35.43	2.0703	19 4 30.3	5.650
4	7 15 46.71	2.1234	21 45 57.6	1.115	4	8 56 39.60	2.0686	18 58 48.7	5.737
5	7 17 54.10	2.1231	21 44 47.6	1.217	5	8 58 43.66	2.0668	18 53 1.8	5.825
6	7 20 1.48	2.1228	21 43 31.5	1.318	6	9 0 47.62	2.0652	18 47 9.7	5.912
7	7 22 8.84	2.1223	21 42 9.4	1.419	7	9 2 51.48	2.0634	18 41 12.3	6.000
8	7 24 16.16	2.1217	21 40 41.2	1.521	8	9 4 55.23	2.0617	18 35 9.7	6.086
9	7 26 23.45	2.1213	21 39 6.9	1.622	9	9 6 58.88	2.0599	18 29 2.0	6.172
10	7 28 30.72	2.1208	21 37 26.5	1.723	10	9 9 2.42	2.0581	18 22 49.1	6.257
11	7 30 37.95	2.1202	21 35 40.1	1.824	11	9 11 5.85	2.0563	18 16 31.1	6.342
12	7 32 45.14	2.1195	21 33 47.6	1.925	12	9 13 9.18	2.0546	18 10 8.1	6.426
13	7 34 52.29	2.1188	21 31 49.1	2.026	13	9 15 12.40	2.0527	18 3 40.0	6.510
14	7 36 59.40	2.1182	21 29 44.5	2.127	14	9 17 15.51	2.0510	17 57 6.9	6.593
15	7 39 6.47	2.1175	21 27 33.9	2.227	15	9 19 18.52	2.0492	17 50 28.8	6.677
16	7 41 13.50	2.1167	21 25 17.3	2.327	16	9 21 21.42	2.0474	17 43 45.7	6.759
17	7 43 20.47	2.1158	21 22 54.7	2.427	17	9 23 24.21	2.0456	17 36 57.7	6.841
18	7 45 27.39	2.1150	21 20 26.1	2.527	18	9 25 26.89	2.0438	17 30 4.8	6.922
19	7 47 34.27	2.1142	21 17 51.5	2.626	19	9 27 29.47	2.0421	17 23 7.1	7.003
20	7 49 41.09	2.1132	21 15 11.0	2.725	20	9 29 31.94	2.0402	17 16 4.5	7.083
21	7 51 47.85	2.1122	21 12 24.5	2.824	21	9 31 34.30	2.0384	17 8 57.1	7.162
22	7 53 54.55	2.1112	21 9 32.1	2.923	22	9 33 36.55	2.0366	17 1 45.0	7.242
23	7 56 1.19	2.1102	21 6 33.7	3.022	23	9 35 38.69	2.0348	16 54 28.1	7.321
24	7 58 7.77	2.1091	N. 21 3 29.5	3.119	24	9 37 40.73	2.0331	N. 16 47 6.5	7.399

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 13.					MONDAY 15.				
0	9 37 40.73	2.0331	N. 16 47 6.5	7.399.	0	11 13 30.28	1.9694	N. 9 32 47.4	10.467
1	9 39 42.66	2.0312	16 39 40.2	7.477	1	11 15 28.43	1.9688	9 22 17.9	10.516
2	9 41 44.48	2.0295	16 32 9.3	7.553	2	11 17 26.54	1.9682	9 11 45.5	10.564
3	9 43 46.20	2.0277	16 24 33.8	7.630	3	11 19 24.62	1.9678	9 1 10.2	10.612
4	9 45 47.81	2.0260	16 16 53.7	7.707	4	11 21 22.68	1.9674	8 50 32.1	10.658
5	9 47 49.32	2.0242	16 9 9.0	7.782	5	11 23 20.71	1.9670	8 39 51.2	10.705
6	9 49 50.72	2.0225	16 1 19.9	7.856	6	11 25 18.72	1.9667	8 29 7.5	10.751
7	9 51 52.02	2.0207	15 53 26.3	7.931	7	11 27 16.71	1.9664	8 18 21.1	10.795
8	9 53 53.21	2.0190	15 45 28.2	8.005	8	11 29 14.69	1.9662	8 7 32.1	10.839
9	9 55 54.30	2.0174	15 37 25.7	8.077	9	11 31 12.65	1.9659	7 56 40.4	10.883
10	9 57 55.30	2.0157	15 29 18.9	8.150	10	11 33 10.60	1.9657	7 45 46.1	10.927
11	9 59 56.19	2.0140	15 21 7.7	8.222	11	11 35 8.54	1.9657	7 34 49.2	10.968
12	10 1 56.98	2.0123	15 12 52.2	8.294	12	11 37 6.48	1.9657	7 23 49.9	11.009
13	10 3 57.67	2.0107	15 4 32.4	8.365	13	11 39 4.42	1.9657	7 12 48.1	11.051
14	10 5 58.26	2.0091	14 56 8.4	8.435	14	11 41 2.36	1.9657	7 1 43.8	11.091
15	10 7 58.76	2.0075	14 47 40.2	8.504	15	11 43 0.30	1.9657	6 50 37.2	11.130
16	10 9 59.16	2.0059	14 39 7.9	8.573	16	11 44 58.24	1.9658	6 39 28.2	11.169
17	10 11 59.47	2.0043	14 30 31.4	8.642	17	11 46 56.20	1.9661	6 28 16.9	11.207
18	10 13 59.68	2.0027	14 21 50.8	8.711	18	11 48 54.17	1.9663	6 17 3.3	11.245
19	10 15 59.80	2.0012	14 13 6.1	8.778	19	11 50 52.16	1.9667	6 5 47.5	11.282
20	10 17 59.83	1.9997	14 4 17.4	8.844	20	11 52 50.17	1.9670	5 54 29.5	11.318
21	10 19 59.77	1.9982	13 55 24.8	8.910	21	11 54 48.20	1.9674	5 43 9.3	11.353
22	10 21 59.62	1.9967	13 46 28.2	8.977	22	11 56 46.26	1.9678	5 31 47.1	11.387
23	10 23 59.38	1.9953	N. 13 37 27.6	9.042	23	11 58 44.34	1.9683	N. 5 20 22.8	11.422
SUNDAY 14.					TUESDAY 16.				
0	10 25 59.06	1.9940	N. 13 28 23.2	9.106	0	12 0 42.46	1.9690	N. 5 8 56.4	11.456
1	10 27 58.66	1.9926	13 19 14.9	9.170	1	12 2 40.62	1.9696	4 57 28.1	11.488
2	10 29 58.17	1.9912	13 10 2.8	9.232	2	12 4 38.81	1.9702	4 45 57.8	11.520
3	10 31 57.60	1.9898	13 0 47.0	9.295	3	12 6 37.04	1.9709	4 34 25.7	11.551
4	10 33 56.95	1.9885	12 51 27.4	9.357	4	12 8 35.32	1.9717	4 22 51.7	11.582
5	10 35 56.22	1.9872	12 42 4.1	9.419	5	12 10 33.65	1.9726	4 11 15.9	11.612
6	10 37 55.42	1.9861	12 32 37.2	9.479	6	12 12 32.03	1.9735	3 59 38.3	11.641
7	10 39 54.55	1.9848	12 23 6.6	9.540	7	12 14 30.47	1.9745	3 47 59.0	11.669
8	10 41 53.60	1.9836	12 13 32.4	9.599	8	12 16 28.97	1.9755	3 36 18.0	11.697
9	10 43 52.58	1.9825	12 3 54.7	9.658	9	12 18 27.53	1.9766	3 24 35.3	11.724
10	10 45 51.50	1.9814	11 54 13.4	9.717	10	12 20 26.16	1.9777	3 12 51.1	11.749
11	10 47 50.35	1.9802	11 44 28.7	9.774	11	12 22 24.85	1.9788	3 1 5.4	11.775
12	10 49 49.13	1.9792	11 34 40.5	9.832	12	12 24 23.62	1.9802	2 49 18.1	11.800
13	10 51 47.85	1.9782	11 24 48.9	9.888	13	12 26 22.47	1.9814	2 37 29.4	11.824
14	10 53 46.51	1.9772	11 14 54.0	9.943	14	12 28 21.39	1.9827	2 25 39.2	11.847
15	10 55 45.11	1.9762	11 4 55.7	9.999	15	12 30 20.40	1.9842	2 13 47.7	11.869
16	10 57 43.66	1.9753	10 54 54.1	10.054	16	12 32 19.50	1.9857	2 1 54.9	11.891
17	10 59 42.15	1.9744	10 44 49.2	10.107	17	12 34 18.69	1.9873	1 50 0.8	11.912
18	11 1 40.59	1.9736	10 34 41.2	10.160	18	12 36 17.98	1.9889	1 38 5.5	11.932
19	11 3 38.98	1.9728	10 24 30.0	10.213	19	12 38 17.36	1.9906	1 26 9.0	11.951
20	11 5 37.33	1.9721	10 14 15.6	10.266	20	12 40 16.85	1.9923	1 14 11.4	11.969
21	11 7 35.63	1.9713	10 3 58.1	10.317	21	12 42 16.44	1.9942	1 2 12.7	11.987
22	11 9 33.88	1.9706	9 53 37.6	10.367	22	12 44 16.15	1.9961	0 50 12.9	12.004
23	11 11 32.10	1.9700	9 43 14.0	10.418	23	12 46 15.97	1.9979	0 38 12.2	12.020
24	11 13 30.28	1.9694	N. 9 32 47.4	10.467	24	12 48 15.90	1.9999	N. 0 26 10.5	12.036

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 17.					FRIDAY 19.				
0	12 48 15.90	1.9999	N. 0 26 10.5	12.036	0	14 27 48.28	2.1728	S. 9 11 52.3	11.662
1	12 50 15.96	2.0020	0 14 7.9	12.050	1	14 29 58.80	2.1780	9 23 31.0	11.627
2	12 52 16.14	2.0041	0 2 4.5	12.063	2	14 32 9.64	2.1833	9 35 7.5	11.590
3	12 54 16.45	2.0063	S. 0 9 59.7	12.076	3	14 34 20.80	2.1886	9 46 41.8	11.553
4	12 56 16.90	2.0086	0 22 4.6	12.087	4	14 36 32.27	2.1939	9 58 13.9	11.516
5	12 58 17.48	2.0108	0 34 10.2	12.099	5	14 38 44.07	2.1993	10 9 43.7	11.476
6	13 0 18.20	2.0132	0 46 16.5	12.110	6	14 40 56.19	2.2047	10 21 11.0	11.434
7	13 2 19.07	2.0157	0 58 23.4	12.119	7	14 43 8.64	2.2103	10 32 35.8	11.392
8	13 4 20.08	2.0182	1 10 30.8	12.127	8	14 45 21.43	2.2160	10 43 58.0	11.348
9	13 6 21.25	2.0208	1 22 38.6	12.134	9	14 47 34.56	2.2216	10 55 17.6	11.304
10	13 8 22.58	2.0234	1 34 46.9	12.142	10	14 49 48.02	2.2272	11 6 34.5	11.257
11	13 10 24.06	2.0261	1 46 55.6	12.148	11	14 52 1.82	2.2329	11 17 48.5	11.209
12	13 12 25.71	2.0289	1 59 4.6	12.153	12	14 54 15.97	2.2387	11 28 59.6	11.160
13	13 14 27.53	2.0317	2 11 13.9	12.157	13	14 56 30.47	2.2446	11 40 7.7	11.110
14	13 16 29.52	2.0346	2 23 23.4	12.159	14	14 58 45.32	2.2504	11 51 12.8	11.058
15	13 18 31.68	2.0376	2 35 33.0	12.162	15	15 1 0.52	2.2563	12 2 14.7	10.995
16	13 20 34.03	2.0407	2 47 42.8	12.163	16	15 3 16.08	2.2623	12 13 13.4	10.951
17	13 22 36.56	2.0437	2 59 52.6	12.163	17	15 5 32.00	2.2684	12 24 8.8	10.894
18	13 24 39.28	2.0469	3 12 2.4	12.163	18	15 7 48.29	2.2745	12 35 0.7	10.836
19	13 26 42.19	2.0502	3 24 12.2	12.162	19	15 10 4.94	2.2805	12 45 49.1	10.777
20	13 28 45.30	2.0535	3 36 21.8	12.158	20	15 12 21.95	2.2867	12 56 34.0	10.717
21	13 30 48.61	2.0569	3 48 31.2	12.155	21	15 14 39.34	2.2929	13 7 15.2	10.655
22	13 32 52.13	2.0603	4 0 40.4	12.151	22	15 16 57.10	2.2991	13 17 52.6	10.592
23	13 34 55.85	2.0637	S. 4 12 49.3	12.146	23	15 19 15.23	2.3053	S. 13 28 26.2	10.528
THURSDAY 18.					SATURDAY 20.				
0	13 36 59.78	2.0673	S. 4 24 57.9	12.139	0	15 21 33.74	2.3117	S. 13 38 55.9	10.462
1	13 39 3.93	2.0710	4 37 6.0	12.132	1	15 23 52.63	2.3180	13 49 21.6	10.393
2	13 41 8.30	2.0747	4 49 13.7	12.124	2	15 26 11.90	2.3243	13 59 43.1	10.323
3	13 43 12.90	2.0785	5 1 20.9	12.114	3	15 28 31.55	2.3307	14 10 0.4	10.252
4	13 45 17.72	2.0823	5 13 27.4	12.103	4	15 30 51.58	2.3371	14 20 13.4	10.180
5	13 47 22.78	2.0863	5 25 33.3	12.092	5	15 33 12.00	2.3436	14 30 22.0	10.106
6	13 49 28.08	2.0902	5 37 38.4	12.079	6	15 35 32.81	2.3501	14 40 26.1	10.031
7	13 51 33.61	2.0942	5 49 42.8	12.066	7	15 37 54.01	2.3566	14 50 25.7	9.954
8	13 53 39.39	2.0984	6 1 46.3	12.051	8	15 40 15.60	2.3631	15 0 20.6	9.875
9	13 55 45.42	2.1026	6 13 48.9	12.035	9	15 42 37.58	2.3696	15 10 10.7	9.795
10	13 57 51.70	2.1068	6 25 50.5	12.018	10	15 44 59.95	2.3762	15 19 56.0	9.713
11	13 59 58.23	2.1111	6 37 51.1	12.001	11	15 47 22.72	2.3827	15 29 36.3	9.630
12	14 2 5.03	2.1155	6 49 50.6	11.982	12	15 49 45.88	2.3893	15 39 11.6	9.546
13	14 4 2.09	2.1199	7 1 48.9	11.962	13	15 52 9.44	2.3959	15 48 41.8	9.459
14	14 6 19.42	2.1244	7 13 46.0	11.940	14	15 54 33.39	2.4025	15 58 6.7	9.371
15	14 8 27.02	2.1290	7 25 41.7	11.917	15	15 56 57.74	2.4091	16 7 26.3	9.282
16	14 10 34.90	2.1336	7 37 36.0	11.892	16	15 59 22.48	2.4157	16 16 40.5	9.190
17	14 12 43.05	2.1383	7 49 28.8	11.868	17	16 1 47.62	2.4223	16 25 49.1	9.097
18	14 14 51.49	2.1431	8 1 20.2	11.843	18	16 4 13.16	2.4290	16 34 52.1	9.008
19	14 17 0.22	2.1478	8 13 10.0	11.816	19	16 6 39.10	2.4356	16 43 49.5	8.907
20	14 19 9.23	2.1527	8 24 58.1	11.787	20	16 9 5.43	2.4422	16 52 41.0	8.809
21	14 21 18.54	2.1577	8 36 44.4	11.757	21	16 11 32.16	2.4487	17 1 26.6	8.710
22	14 23 28.15	2.1627	8 48 28.9	11.727	22	16 13 59.28	2.4553	17 10 6.2	8.609
23	14 25 38.06	2.1677	9 0 11.6	11.695	23	16 16 26.80	2.4619	17 18 39.7	8.507
24	14 27 48.28	2.1728	S. 9 11 52.3	11.662	24	16 18 54.71	2.4684	S. 17 27 7.1	8.404



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 21.					TUESDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	16 18 54.71	2.4684	S. 17 27 7.1	8.404	0	18 23 58.33	2.7087	S. 21 42 34.5	1.753
1	16 21 23.01	2.4750	17 35 28.2	8.298	1	18 26 40.92	2.7110	21 44 14.7	1.587
2	16 23 51.71	2.4816	17 43 42.9	8.191	2	18 29 23.65	2.7132	21 45 45.0	1.422
3	16 26 20.80	2.4881	17 51 51.1	8.082	3	18 32 6.51	2.7152	21 47 5.4	1.257
4	16 28 50.28	2.4945	17 59 52.7	7.972	4	18 34 49.48	2.7171	21 48 15.8	1.091
5	16 31 20.14	2.5009	18 7 47.7	7.860	5	18 37 32.56	2.7187	21 49 16.3	0.925
6	16 33 50.39	2.5073	18 15 35.9	7.746	6	18 40 15.73	2.7202	21 50 6.8	0.757
7	16 36 21.02	2.5137	18 23 17.2	7.631	7	18 42 58.99	2.7217	21 50 47.2	0.590
8	16 38 52.03	2.5200	18 30 51.6	7.515	8	18 45 42.33	2.7230	21 51 17.6	0.423
9	16 41 23.42	2.5263	18 38 19.0	7.397	9	18 48 25.75	2.7241	21 51 38.0	0.256
10	16 43 55.19	2.5327	18 45 39.2	7.277	10	18 51 9.22	2.7249	21 51 48.3	-0.087
11	16 46 27.34	2.5388	18 52 52.2	7.156	11	18 53 52.74	2.7257	21 51 48.5	+0.080
12	16 48 59.85	2.5449	18 59 57.9	7.033	12	18 56 36.31	2.7264	21 51 38.7	0.248
13	16 51 32.73	2.5511	19 6 56.2	6.909	13	18 59 19.91	2.7268	21 51 18.8	0.417
14	16 54 5.98	2.5572	19 13 47.0	6.783	14	19 2 3.53	2.7271	21 50 48.7	0.586
15	16 56 39.59	2.5631	19 20 30.2	6.656	15	19 4 47.16	2.7272	21 50 8.5	0.754
16	16 59 13.55	2.5690	19 27 5.7	6.527	16	19 7 30.79	2.7272	21 49 18.2	0.922
17	17 1 47.87	2.5749	19 33 33.4	6.397	17	19 10 14.42	2.7270	21 48 17.9	1.089
18	17 4 22.54	2.5807	19 39 53.3	6.266	18	19 12 58.03	2.7267	21 47 7.5	1.257
19	17 6 57.55	2.5864	19 46 5.3	6.132	19	19 15 41.62	2.7262	21 45 47.0	1.426
20	17 9 32.91	2.5921	19 52 9.2	5.997	20	19 18 25.17	2.7255	21 44 16.4	1.593
21	17 12 8.60	2.5976	19 58 5.0	5.862	21	19 21 8.68	2.7247	21 42 35.8	1.760
22	17 14 44.62	2.6031	20 3 52.6	5.725	22	19 23 52.14	2.7237	21 40 45.2	1.927
23	17 17 20.97	2.6086	S. 20 9 32.0	5.587	23	19 26 35.53	2.7226	S. 21 38 44.5	2.094
MONDAY 22.					WEDNESDAY 24.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	17 19 57.65	2.6139	S. 20 15 3.0	5.447	0	19 29 18.85	2.7213	S. 21 36 33.9	2.260
1	17 22 34.64	2.6191	20 20 25.6	5.305	1	19 32 2.09	2.7199	21 34 13.3	2.427
2	17 25 11.94	2.6242	20 25 39.6	5.162	2	19 34 45.24	2.7182	21 31 42.7	2.592
3	17 27 49.55	2.6293	20 30 45.1	5.019	3	19 37 28.28	2.7164	21 29 2.2	2.757
4	17 30 27.46	2.6343	20 35 41.9	4.873	4	19 40 11.21	2.7146	21 26 11.9	2.921
5	17 33 5.67	2.6392	20 40 29.9	4.727	5	19 42 54.03	2.7126	21 23 11.7	3.084
6	17 35 44.16	2.6438	20 45 9.1	4.579	6	19 45 36.72	2.7103	21 20 1.8	3.247
7	17 38 22.93	2.6485	20 49 39.4	4.431	7	19 48 19.27	2.7080	21 16 42.1	3.410
8	17 41 1.98	2.6530	20 54 0.8	4.282	8	19 51 1.68	2.7055	21 13 12.6	3.572
9	17 43 41.29	2.6574	20 58 13.2	4.130	9	19 53 43.93	2.7029	21 9 33.5	3.732
10	17 46 20.87	2.6618	21 2 16.4	3.977	10	19 56 26.03	2.7002	21 5 44.8	3.892
11	17 49 0.71	2.6660	21 6 10.5	3.825	11	19 59 7.96	2.6972	21 1 46.5	4.052
12	17 51 40.79	2.6700	21 9 55.4	3.671	12	20 1 49.70	2.6942	20 57 38.6	4.210
13	17 54 21.11	2.6740	21 13 31.0	3.515	13	20 4 31.26	2.6911	20 53 21.3	4.367
14	17 57 1.67	2.6778	21 16 57.2	3.359	14	20 7 12.63	2.6878	20 48 54.5	4.524
15	17 59 42.45	2.6815	21 20 14.1	3.202	15	20 9 53.79	2.6842	20 44 18.4	4.678
16	18 2 23.45	2.6851	21 23 21.5	3.044	16	20 12 34.74	2.6807	20 39 33.1	4.833
17	18 5 4.66	2.6885	21 26 19.4	2.885	17	20 15 15.47	2.6770	20 34 38.5	4.987
18	18 7 46.07	2.6918	21 29 7.7	2.726	18	20 17 55.98	2.6732	20 29 34.7	5.139
19	18 10 27.68	2.6950	21 31 46.5	2.566	19	20 20 36.25	2.6692	20 24 21.8	5.290
20	18 13 9.47	2.6980	21 34 15.6	2.403	20	20 23 16.29	2.6652	20 18 59.9	5.440
21	18 15 51.44	2.7009	21 36 34.9	2.241	21	20 25 56.08	2.6611	20 13 29.0	5.589
22	18 18 33.58	2.7037	21 38 44.5	2.079	22	20 28 35.62	2.6567	20 7 49.2	5.737
23	18 21 15.88	2.7062	21 40 44.4	1.917	23	20 31 14.89	2.6523	20 2 0.6	5.883
24	18 23 58.33	2.7097	S. 21 42 34.5	1.753	24	20 33 53.90	2.6479	S. 19 56 3.3	6.027

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 25.					SATURDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	20 33 53.90	2.6479	S. 19 56 3.3	6.027	0	22 34 27.61	2.3620	S. 12 48 36.8	11.141
1	20 36 32.64	2.6432	19 49 57.3	6.172	1	22 36 49.14	2.3557	12 37 26.4	11.206
2	20 39 11.09	2.6384	19 43 42.7	6.314	2	22 39 10.30	2.3495	12 26 12.1	11.269
3	20 41 49.25	2.6336	19 37 19.6	6.455	3	22 41 31.08	2.3432	12 14 54.1	11.330
4	20 44 27.12	2.6287	19 30 48.1	6.595	4	22 43 51.48	2.3370	12 3 32.5	11.390
5	20 47 4.70	2.6238	19 24 8.2	6.733	5	22 46 11.52	2.3309	11 52 7.3	11.448
6	20 49 41.98	2.6187	19 17 20.1	6.870	6	22 48 31.19	2.3247	11 40 38.7	11.505
7	20 52 18.95	2.6135	19 10 23.8	7.005	7	22 50 50.48	2.3185	11 29 6.7	11.560
8	20 54 55.60	2.6082	19 3 19.5	7.139	8	22 53 9.41	2.3125	11 17 31.5	11.613
9	20 57 31.94	2.6029	18 56 7.1	7.272	9	22 55 27.98	2.3065	11 5 53.1	11.665
10	21 0 7.95	2.5975	18 48 46.8	7.402	10	22 57 46.19	2.3004	10 54 11.7	11.715
11	21 2 43.64	2.5920	18 41 18.8	7.532	11	23 0 4.03	2.2944	10 42 27.3	11.763
12	21 5 18.99	2.5863	18 33 43.0	7.660	12	23 2 21.52	2.2885	10 30 40.1	11.810
13	21 7 54.00	2.5807	18 25 59.6	7.786	13	23 4 38.65	2.2826	10 18 50.1	11.855
14	21 10 28.68	2.5751	18 18 8.7	7.911	14	23 6 55.43	2.2768	10 6 57.5	11.899
15	21 13 3.01	2.5693	18 10 10.3	8.034	15	23 9 11.87	2.2711	9 55 2.2	11.942
16	21 15 36.99	2.5634	18 2 4.6	8.155	16	23 11 27.96	2.2652	9 43 4.4	11.982
17	21 18 10.62	2.5576	17 53 51.7	8.275	17	23 13 43.70	2.2595	9 31 4.3	12.021
18	21 20 43.90	2.5517	17 45 31.6	8.393	18	23 15 59.10	2.2538	9 19 1.9	12.059
19	21 23 16.82	2.5457	17 37 4.5	8.510	19	23 18 14.16	2.2482	9 6 57.2	12.096
20	21 25 49.38	2.5396	17 28 30.4	8.625	20	23 20 28.89	2.2427	8 54 50.4	12.130
21	21 28 21.57	2.5335	17 19 49.5	8.737	21	23 22 43.28	2.2371	8 42 41.6	12.163
22	21 30 53.40	2.5274	17 11 1.9	8.849	22	23 24 57.34	2.2317	8 30 30.8	12.195
23	21 33 24.86	2.5212	S. 17 2 7.6	8.959	23	23 27 11.08	2.2263	S. 8 18 18.2	12.225
FRIDAY 26.					SUNDAY 28.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	21 35 55.94	2.5149	S. 16 53 6.8	9.067	0	23 29 24.50	2.2210	S. 8 6 3.8	12.254
1	21 38 26.65	2.5087	16 43 59.6	9.173	1	23 31 37.60	2.2157	7 53 47.7	12.282
2	21 40 56.99	2.5025	16 34 46.0	9.278	2	23 33 50.38	2.2103	7 41 30.0	12.307
3	21 43 26.95	2.4962	16 25 26.2	9.381	3	23 36 2.84	2.2052	7 29 10.8	12.332
4	21 45 56.54	2.4899	16 16 0.3	9.482	4	23 38 15.00	2.2001	7 16 50.2	12.355
5	21 48 25.74	2.4835	16 6 28.4	9.582	5	23 40 26.85	2.1950	7 4 28.2	12.377
6	21 50 54.56	2.4772	15 56 50.5	9.680	6	23 42 38.40	2.1900	6 52 4.9	12.398
7	21 53 23.00	2.4708	15 47 6.8	9.776	7	23 44 49.65	2.1850	6 39 40.4	12.417
8	21 55 51.06	2.4644	15 37 17.4	9.869	8	23 47 0.60	2.1801	6 27 14.9	12.434
9	21 58 18.73	2.4580	15 27 22.5	9.962	9	23 49 11.26	2.1752	6 14 48.3	12.452
10	22 0 46.02	2.4516	15 17 22.0	10.053	10	23 51 21.63	2.1704	6 2 20.7	12.467
11	22 3 12.92	2.4452	15 7 16.1	10.142	11	23 53 31.71	2.1657	5 49 52.3	12.480
12	22 5 39.44	2.4387	14 57 5.0	10.228	12	23 55 41.51	2.1610	5 37 23.1	12.492
13	22 8 5.57	2.4322	14 46 48.7	10.314	13	23 57 51.03	2.1564	5 24 53.2	12.504
14	22 10 31.31	2.4258	14 36 27.3	10.398	14	0 0 0.28	2.1519	5 12 22.6	12.515
15	22 12 56.67	2.4194	14 26 0.9	10.481	15	0 2 9.26	2.1474	4 59 51.4	12.523
16	22 15 21.64	2.4130	14 15 29.6	10.561	16	0 4 17.97	2.1430	4 47 19.8	12.531
17	22 17 46.23	2.4066	14 4 53.6	10.639	17	0 6 26.42	2.1387	4 34 47.7	12.537
18	22 20 10.43	2.4002	13 54 12.9	10.716	18	0 8 34.61	2.1343	4 22 15.3	12.542
19	22 22 34.25	2.3938	13 43 27.7	10.791	19	0 10 42.54	2.1301	4 9 42.6	12.547
20	22 24 57.69	2.3874	13 32 38.0	10.864	20	0 12 50.22	2.1259	3 57 9.7	12.549
21	22 27 20.74	2.3810	13 21 44.0	10.936	21	0 14 57.65	2.1218	3 44 36.7	12.551
22	22 29 43.41	2.3747	13 10 45.7	11.006	22	0 17 4.84	2.1178	3 32 3.6	12.552
23	22 32 5.70	2.3683	12 59 43.3	11.074	23	0 19 11.79	2.1138	3 19 30.5	12.552
24	22 34 27.61	2.3620	S. 12 48 36.8	11.141	24	0 21 18.50	2.1099	S. 3 6 57.4	12.550

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 29.					WEDNESDAY 31.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	0 21 18.50	2.1099	S. 3 6 57.4	12.550	0	1 59 18.00	1.9970	N. 6 34 56.5	11.367
1	0 23 24.98	2.1061	2 54 24.5	12.547	1	2 1 17.79	1.9961	6 46 17.2	11.383
2	0 25 31.23	2.1022	2 41 51.8	12.543	2	2 3 17.53	1.9953	6 57 35.3	11.279
3	0 27 37.25	2.0985	2 29 19.3	12.538	3	2 5 17.23	1.9946	7 8 50.7	11.233
4	0 29 43.05	2.0949	2 16 47.2	12.532	4	2 7 16.88	1.9938	7 20 3.3	11.188
5	0 31 48.64	2.0914	2 4 15.5	12.525	5	2 9 16.48	1.9931	7 31 13.2	11.142
6	0 33 54.02	2.0878	1 51 44.2	12.517	6	2 11 16.05	1.9926	7 42 20.3	11.094
7	0 35 59.18	2.0843	1 39 13.5	12.507	7	2 13 15.59	1.9920	7 53 24.5	11.047
8	0 38 4.14	2.0810	1 26 43.3	12.498	8	2 15 15.09	1.9914	8 4 25.9	10.998
9	0 40 8.90	2.0777	1 14 13.7	12.487	9	2 17 14.56	1.9910	8 15 24.3	10.948
10	0 42 13.46	2.0743	1 1 44.9	12.473	10	2 19 14.01	1.9907	8 26 19.7	10.899
11	0 44 17.82	2.0712	0 49 16.9	12.461	11	2 21 13.44	1.9902	8 37 12.2	10.849
12	0 46 22.00	2.0681	0 36 49.6	12.447	12	2 23 12.84	1.9898	8 48 1.6	10.797
13	0 48 25.99	2.0650	0 24 23.2	12.432	13	2 25 12.22	1.9897	8 58 47.9	10.747
14	0 50 29.80	2.0620	S. 0 11 57.8	12.415	14	2 27 11.60	1.9896	9 9 31.2	10.695
15	0 52 33.43	2.0591	N. 0 0 26.6	12.398	15	2 29 10.97	1.9893	9 20 11.3	10.642
16	0 54 36.89	2.0562	0 12 50.0	12.381	16	2 31 10.32	1.9892	9 30 48.2	10.588
17	0 56 40.17	2.0533	0 25 12.3	12.362	17	2 33 9.67	1.9892	9 41 21.9	10.534
18	0 58 43.29	2.0507	0 37 33.5	12.342	18	2 35 9.02	1.9892	9 51 52.3	10.480
19	1 0 46.25	2.0480	0 49 53.4	12.321	19	2 37 8.37	1.9892	10 2 19.5	10.426
20	1 2 49.05	2.0453	1 2 12.0	12.299	20	2 39 7.72	1.9892	10 12 43.4	10.370
21	1 4 51.69	2.0427	1 14 29.3	12.277	21	2 41 7.08	1.9893	10 23 3.9	10.313
22	1 6 54.18	2.0402	1 26 45.2	12.253	22	2 43 6.44	1.9895	10 33 21.0	10.256
23	1 8 56.52	2.0378	N. 1 38 59.7	12.230	23	2 45 5.82	1.9897	N. 10 43 34.6	10.198
TUESDAY 30.					THURSDAY, AUGUST 1.				
0	1 10 58.72	2.0355	N. 1 51 12.8	12.205	0	2 47 5.21	1.9900	N. 10 53 44.8	10.141
1	1 13 0.78	2.0332	2 3 24.3	12.178	PHASES OF THE MOON.				
2	1 15 2.70	2.0309	2 15 34.2	12.152					
3	1 17 4.49	2.0288	2 27 42.5	12.124					
4	1 19 6.16	2.0267	2 39 49.1	12.096					
5	1 21 7.70	2.0246	2 51 54.0	12.067	<div> <div>d h m</div> <div>☾ Last Quarter . . . July 2 2 33.9</div> <div>● New Moon . . . . . 10 3 17.1</div> <div>☽ First Quarter . . . . . 18 1 11.6</div> <div>○ Full Moon . . . . . 24 16 29.5</div> <div>☾ Last Quarter . . . . . 31 14 25.5</div> </div>				
6	1 23 9.11	2.0226	3 3 57.1	12.037					
7	1 25 10.41	2.0207	3 15 58.4	12.006					
8	1 27 11.60	2.0188	3 27 57.8	11.974					
9	1 29 12.67	2.0170	3 39 55.3	11.942	<div> <div>d h</div> <div>☾ Apogee . . . . . July 9 10.3</div> <div>☾ Perigee . . . . . 24 0.0</div> </div>				
10	1 31 13.64	2.0152	3 51 50.9	11.909					
11	1 33 14.50	2.0136	4 3 44.4	11.874					
12	1 35 15.27	2.0120	4 15 35.8	11.839					
13	1 37 15.94	2.0104	4 27 25.1	11.804					
14	1 39 16.52	2.0089	4 39 12.3	11.768					
15	1 41 17.01	2.0074	4 50 57.3	11.732					
16	1 43 17.41	2.0060	5 2 40.1	11.694					
17	1 45 17.73	2.0047	5 14 20.6	11.655					
18	1 47 17.98	2.0035	5 25 58.7	11.616					
19	1 49 18.15	2.0022	5 37 34.5	11.577					
20	1 51 18.25	2.0011	5 49 7.9	11.536					
21	1 53 18.28	2.0000	6 0 38.8	11.495					
22	1 55 18.25	1.9989	6 12 7.3	11.453					
23	1 57 18.15	1.9979	6 23 33.2	11.410					
24	1 59 18.00	1.9970	N. 6 34 56.5	11.367					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	<i>α</i> Aquilæ W. Aldebaran E. SUN E.	62 9 55 73 19 43 103 36 38	3325 2515 2832	63 33 38 71 38 51 102 2 52	3320 2533 2851	64 57 27 69 58 23 100 29 31	3316 2551 2869	66 21 20 68 18 20 98 56 33	3314 2567 2888
2	<i>α</i> Aquilæ W. Fomalhaut W. Aldebaran E. SUN E.	73 20 49 38 2 1 60 3 53 91 17 34	3325 3237 2651 2978	74 44 32 39 27 26 58 26 8 89 46 54	3330 3211 2667 2995	76 8 9 40 53 22 56 48 44 88 16 35	3336 3191 2683 3012	77 31 39 42 19 43 55 11 41 86 46 37	3343 3176 2698 3028
3	<i>α</i> Aquilæ W. Fomalhaut W. <i>α</i> Pegasi W. SATURN W. Aldebaran E. SUN E.	84 26 46 49 34 43 37 38 34 23 48 3 47 11 31 79 21 47	3390 3139 3982 2797 2772 3107	85 49 14 51 2 6 38 50 32 25 22 35 45 36 26 77 53 46	3401 3137 3916 2808 2786 3122	87 11 29 52 29 31 40 3 36 26 56 52 44 1 40 76 26 3	3413 3135 3856 2819 2799 3136	88 33 31 53 56 58 41 17 40 28 30 55 42 27 11 74 58 37	3425 3134 3803 2830 2813 3150
4	<i>α</i> Aquilæ W. Fomalhaut W. <i>α</i> Pegasi W. SATURN W. Aldebaran E. SUN E.	95 20 4 61 14 1 47 39 35 36 17 38 34 39 0 67 45 33	3493 3144 3625 2883 2875 3215	96 40 36 62 41 17 48 57 42 37 50 18 33 6 9 66 19 42	3508 3148 3601 2893 2887 3227	98 0 52 64 8 29 50 16 15 39 22 45 31 33 33 64 54 5	3524 3151 3580 2903 2898 3239	99 20 50 65 35 37 51 35 11 40 55 0 30 1 11 63 28 41	3539 3155 3562 2913 2909 3249
5	<i>α</i> Aquilæ W. Fomalhaut W. <i>α</i> Pegasi W. SATURN W. SUN E.	105 56 6 72 49 58 58 14 12 48 33 15 56 24 53	3628 3178 3497 2958 3300	107 14 10 74 16 33 59 34 39 50 4 21 55 0 42	3648 3183 3488 2965 3309	108 31 53 75 43 3 60 55 16 51 35 18 53 36 41	3669 3188 3480 2973 3318	109 49 15 77 9 27 62 16 2 53 6 5 52 12 50	3690 3193 3474 2980 3326
6	Fomalhaut W. <i>α</i> Pegasi W. SATURN W. SUN E.	84 19 58 69 1 21 60 37 50 45 15 52	3218 3453 3012 3363	85 45 46 70 22 38 62 7 47 43 52 53	3223 3451 3018 3369	87 11 29 71 43 57 63 37 38 42 30 1	3228 3448 3023 3375	88 37 5 73 5 19 65 7 23 41 7 16	3232 3446 3028 3380
7	Fomalhaut W. <i>α</i> Pegasi W. SATURN W. SUN E.	95 43 41 79 52 27 72 34 38 34 15 0	3257 3444 3049 3404	97 8 42 81 13 54 74 3 50 32 52 48	3262 3445 3053 3409	98 33 38 82 35 20 75 32 57 31 30 42	3267 3445 3056 3412	100 8 28 83 56 46 77 2 1 30 8 39	3272 3446 3059 3415
12	SUN W. Spica E. Antares E.	20 19 20 73 22 14 119 14 41	3390 3068 3087	21 41 48 71 53 25 117 46 16	3385 3065 3082	23 4 22 70 24 32 116 17 44	3380 3061 3076	24 27 1 68 55 34 114 49 5	3375 3057 3071
13	SUN W. Spica E. Antares E.	31 21 47 61 29 36 107 24 3	3347 3037 3040	32 45 4 60 0 9 105 54 40	3341 3033 3033	34 8 28 58 30 38 104 25 9	3334 3029 3026	35 32 0 57 1 1 102 55 29	3328 3024 3020
14	SUN W. Spica E. Antares E.	42 31 41 49 31 31 95 25 2	3390 3001 2984	43 56 3 48 1 20 93 54 29	3282 2997 2976	45 20 36 46 31 4 92 23 46	3273 2993 2968	46 45 19 45 0 42 90 52 53	3265 2989 2960

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	$\alpha$ Aquilæ W.	67 45 15	3313	69 9 12	3314	70 33 8	3316	71 57 1	3320
	Aldebaran E.	66 38 40	2384	64 59 24	2601	63 20 31	2618	61 42 1	2635
	SUN E.	97 23 59	2907	95 51 49	2925	94 20 2	2942	92 48 37	2960
2	$\alpha$ Aquilæ W.	78 55 1	3352	80 18 12	3361	81 41 14	3370	83 4 5	3380
	Fomalhaut W.	43 46 22	3165	45 13 14	3157	46 40 15	3150	48 7 25	3144
	Aldebaran E.	53 34 59	2714	51 58 38	2729	50 22 36	2744	48 46 54	2758
	SUN E.	85 16 59	3044	83 47 42	3061	82 18 45	3076	80 50 7	3091
3	$\alpha$ Aquilæ W.	89 55 20	3438	91 16 54	3451	92 38 12	3465	93 59 16	3479
	Fomalhaut W.	55 24 26	3135	56 51 53	3137	58 19 18	3139	59 46 41	3141
	$\alpha$ Pegasi W.	42 32 39	3758	43 48 25	3719	45 4 52	3684	46 21 57	3652
	SATURN W.	30 4 44	2841	31 38 18	2852	33 11 38	2868	34 44 45	2873
	Aldebaran E.	40 53 0	2826	39 19 6	2838	37 45 28	2851	36 12 6	2863
	SUN E.	73 31 28	3164	72 4 36	3177	70 38 0	3190	69 11 39	3203
4	$\alpha$ Aquilæ W.	100 40 31	3556	101 59 54	3574	103 18 57	3591	104 37 41	3609
	Fomalhaut W.	67 2 40	3159	68 29 38	3164	69 56 30	3168	71 23 17	3173
	$\alpha$ Pegasi W.	52 54 27	3546	54 14 1	3531	55 33 51	3518	56 53 55	3507
	SATURN W.	42 27 2	2922	43 58 52	2931	45 30 31	2940	47 1 58	2949
	Aldebaran E.	28 29 3	2919	26 57 8	2930	25 25 27	2940	23 53 59	2951
	SUN E.	62 3 30	3261	60 38 33	3271	59 13 48	3281	57 49 15	3291
5	$\alpha$ Aquilæ W.	111 6 13	3712	112 22 47	3735	113 38 57	3759	114 54 42	3784
	Fomalhaut W.	78 35 45	3198	80 1 57	3203	81 28 3	3208	82 54 3	3213
	$\alpha$ Pegasi W.	63 36 55	3469	64 57 54	3464	66 18 58	3460	67 40 7	3456
	SATURN W.	54 36 42	2987	56 7 11	2993	57 37 32	3000	59 7 45	3006
	SUN E.	50 49 9	3334	49 25 37	3342	48 2 14	3349	46 38 59	3356
6	Fomalhaut W.	90 2 36	3237	91 28 1	3242	92 53 20	3247	94 18 33	3252
	$\alpha$ Pegasi W.	74 26 43	3446	75 48 8	3445	77 9 33	3444	78 31 0	3444
	SATURN W.	66 37 1	3033	68 6 33	3037	69 36 0	3041	71 5 21	3045
	SUN E.	39 44 37	3386	38 22 5	3391	36 59 38	3395	35 37 16	3400
7	Fomalhaut W.	101 23 12	3277	102 47 50	3283	104 12 21	3288	105 36 46	3293
	$\alpha$ Pegasi W.	85 18 10	3447	86 39 33	3449	88 0 54	3451	89 22 13	3452
	SATURN W.	78 31 1	3062	79 59 58	3064	81 28 51	3066	82 57 42	3068
	SUN E.	28 46 40	3419	27 24 45	3422	26 2 53	3425	24 41 4	3427
12	SUN W.	25 49 46	3370	27 12 36	3364	28 35 33	3358	29 58 37	3353
	Spica E.	67 26 32	3053	65 57 26	3049	64 28 14	3045	62 58 57	3041
	Antares E.	113 20 20	3065	111 51 27	3059	110 22 27	3052	108 53 19	3046
13	SUN W.	36 55 39	3321	38 19 26	3313	39 43 22	3306	41 7 27	3298
	Spica E.	55 31 18	3020	54 1 30	3015	52 31 36	3010	51 1 36	3006
	Antares E.	101 25 41	3013	99 55 45	3006	98 25 40	2999	96 55 26	2991
14	SUN W.	48 10 12	3256	49 35 15	3246	51 0 30	3236	52 25 57	3226
	Spica E.	43 30 15	2984	41 59 42	2980	40 29 4	2977	38 58 22	2974
	Antares E.	89 21 50	2951	87 50 36	2942	86 19 11	2934	84 47 35	2925

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
15	SUN	W.	53 51 36	3216	55 17 26	3205	56 43 29	3194	58 9 45	3183
	Regulus	W.	17 26 9	2914	18 58 10	2899	20 30 30	2884	22 3 9	2869
	Spica	E.	37 27 37	2971	35 56 48	2969	34 25 57	2968	32 55 4	2969
	Antares	E.	83 15 48	2916	81 43 50	2906	80 11 39	2897	78 39 16	2887
16	SUN	W.	65 24 34	3123	66 52 16	3110	68 20 14	3096	69 48 28	3082
	Regulus	W.	29 51 1	2801	31 25 28	2787	33 0 13	2773	34 35 16	2760
	Antares	E.	70 54 6	2835	69 20 23	2825	67 46 27	2813	66 12 16	2801
	α Aquilæ	E.	115 6 16	3552	113 46 49	3523	112 26 50	3494	111 6 19	3465
17	SUN	W.	77 13 57	3010	78 43 57	2995	80 14 15	2980	81 44 53	2964
	Regulus	W.	42 35 5	2689	44 12 0	2674	45 49 14	2659	47 26 49	2644
	Antares	E.	58 17 37	2744	56 41 55	2732	55 5 58	2720	53 29 45	2709
	α Aquilæ	E.	104 16 6	3338	102 52 39	3316	101 28 47	3294	100 4 29	3273
18	SUN	W.	89 23 8	2882	90 55 50	2865	92 28 54	2848	94 2 20	2831
	Regulus	W.	55 39 52	2566	57 19 33	2550	58 59 36	2534	60 40 2	2518
	Antares	E.	45 24 53	2654	43 47 11	2644	42 9 15	2635	40 31 7	2626
	α Aquilæ	E.	92 57 1	3178	91 30 26	3161	90 3 30	3146	88 36 16	3131
19	SUN	W.	101 55 12	2742	103 30 56	2724	105 7 4	2706	106 43 36	2689
	Regulus	W.	69 7 54	2435	70 50 39	2419	72 33 47	2402	74 17 19	2385
	α Aquilæ	E.	81 15 48	3067	79 46 58	3057	78 17 56	3049	76 48 44	3043
	Fomalhaut	E.	115 5 6	2687	113 28 9	2663	111 50 40	2641	110 12 41	2619
20	SUN	W.	114 52 11	2600	116 31 6	2583	118 10 24	2566	119 50 6	2549
	Regulus	W.	83 1 0	2302	84 46 56	2286	86 33 16	2270	88 19 59	2254
	Spica	W.	29 45 48	2438	31 28 28	2410	33 11 48	2382	34 55 48	2356
	α Aquilæ	E.	69 21 4	3028	67 51 25	3030	66 21 49	3034	64 52 19	3042
	Fomalhaut	E.	101 55 30	2517	100 14 41	2499	98 33 27	2481	96 51 47	2464
	α Pegasi	E.	116 51 56	2792	115 17 18	2762	113 42 0	2733	112 6 4	2706
	SATURN	E.	125 51 13	2299	124 5 12	2282	122 18 46	2266	120 31 56	2250
21	Regulus	W.	97 19 22	2178	99 8 22	2165	100 57 43	2151	102 47 25	2137
	Spica	W.	43 44 32	2247	45 31 50	2229	47 19 34	2211	49 7 45	2194
	α Aquilæ	E.	57 28 11	3123	56 0 29	3150	54 33 20	3183	53 6 50	3220
	Fomalhaut	E.	88 17 35	2387	86 33 40	2373	84 49 26	2360	83 4 53	2348
	α Pegasi	E.	103 57 47	2587	102 18 34	2568	100 38 55	2549	98 58 50	2531
	SATURN	E.	111 31 56	2173	109 42 48	2159	107 53 18	2145	106 3 27	2132
22	Spica	W.	58 14 40	2121	60 5 7	2109	61 55 53	2097	63 46 57	2086
	α Aquilæ	E.	46 8 7	3521	44 48 6	3611	43 29 44	3714	42 13 12	3830
	Fomalhaut	E.	74 18 21	2303	72 32 26	2298	70 46 23	2294	69 0 13	2290
	α Pegasi	E.	90 32 50	2462	88 50 43	2452	87 8 22	2443	85 25 49	2436
	SATURN	E.	96 49 16	2070	94 57 31	2060	93 5 30	2050	91 13 13	2041
23	Spica	W.	73 6 4	2044	74 58 30	2037	76 51 6	2032	78 43 50	2027
	Antares	W.	27 46 21	2208	29 34 37	2183	31 23 31	2160	33 12 59	2140
	Fomalhaut	E.	60 8 55	2296	58 22 49	2302	56 36 53	2311	54 51 10	2323
	α Pegasi	E.	76 51 9	2421	75 8 4	2423	73 25 2	2427	71 42 6	2433
	SATURN	E.	81 48 28	2003	79 54 57	1997	78 1 18	1992	76 7 31	1989
	α Arietis	E.	119 56 39	2207	118 8 22	2195	116 19 46	2184	114 30 54	2174

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
15	SUN W.	59 36 15	3174	61 2 58	3160	62 29 55	3148	63 57 7	3135
	Regulus W.	23 36 7	2855	25 9 24	2841	26 42 59	2828	28 16 51	2814
	Spica E.	31 24 12	2970	29 53 22	2973	28 22 36	2978	26 51 56	2985
	Antares E.	77 6 40	2877	75 33 52	2866	74 0 50	2856	72 27 35	2845
16	SUN W.	71 16 59	3069	72 45 47	3055	74 14 52	3040	75 44 15	3025
	Regulus W.	36 10 37	2746	37 46 16	2732	39 22 13	2718	40 58 29	2703
	Antares E.	64 37 50	2790	63 3 9	2779	61 28 14	2767	59 53 3	2756
	α Aquilæ E.	109 45 16	3438	108 23 42	3412	107 1 39	3386	105 39 7	3361
17	SUN W.	83 15 51	2948	84 47 9	2931	86 18 48	2915	87 50 48	2899
	Regulus W.	49 4 44	2629	50 42 59	2614	52 21 35	2598	54 0 33	2582
	Antares E.	51 53 17	2697	50 16 33	2686	48 39 34	2675	47 2 21	2664
	α Aquilæ E.	98 39 45	3253	97 14 38	3233	95 49 8	3214	94 23 15	3196
18	SUN W.	95 36 9	2813	97 10 20	2795	98 44 54	2778	100 19 51	2760
	Regulus W.	62 20 50	2502	64 2 1	2485	65 43 35	2468	67 25 33	2452
	Antares E.	38 52 47	2618	37 14 17	2612	35 35 38	2607	33 56 52	2603
	α Aquilæ E.	87 8 44	3116	85 40 54	3102	84 12 46	3090	82 44 24	3078
19	SUN W.	108 20 31	2671	109 57 50	2653	111 35 33	2635	113 13 40	2618
	Regulus W.	76 1 15	2368	77 45 35	2352	79 30 19	2335	81 15 27	2318
	α Aquilæ E.	75 19 24	3036	73 49 56	3031	72 20 21	3028	70 50 43	3027
	Fomalhaut E.	108 34 12	2598	106 55 15	2577	105 15 49	2556	103 35 53	2536
20	SUN W.	121 30 12	2533	123 10 40	2516	124 51 31	2499	126 32 45	2482
	Regulus W.	90 7 6	2239	91 54 36	2223	93 42 29	2208	95 30 44	2193
	Spica W.	36 40 26	2332	38 25 39	2309	40 11 25	2287	41 57 43	2266
	α Aquilæ E.	63 22 58	3052	61 53 49	3065	60 24 56	3080	58 56 22	3099
	Fomalhaut E.	95 9 43	2447	93 27 15	2431	91 44 23	2415	90 1 9	2401
	α Pegasi E.	110 29 32	2680	108 52 25	2655	107 14 44	2631	105 36 31	2608
	SATURN E.	118 44 43	2234	116 57 6	2218	115 9 5	2203	113 20 42	2188
21	Regulus W.	104 37 27	2124	106 27 49	2112	108 18 30	2100	110 9 29	2088
	Spica W.	50 56 22	2178	52 45 23	2163	54 34 47	2148	56 24 33	2134
	α Aquilæ E.	51 41 5	3265	50 16 12	3317	48 52 20	3375	47 29 35	3443
	Fomalhaut E.	81 20 4	2337	79 34 59	2327	77 49 38	2318	76 4 5	2310
	α Pegasi E.	97 18 20	2515	95 37 27	2500	93 56 14	2486	92 14 41	2473
	SATURN E.	104 13 16	2118	102 22 44	2105	100 31 53	2093	98 40 43	2082
22	Spica W.	65 38 18	2076	67 29 54	2067	69 21 44	2058	71 13 48	2051
	α Aquilæ E.	40 58 41	3965	39 46 27	4124	38 36 49	4306	37 30 2	4514
	Fomalhaut E.	67 13 59	2288	65 27 41	2287	63 41 23	2288	61 55 7	2291
	α Pegasi E.	83 43 6	2430	82 0 14	2426	80 17 16	2423	78 34 14	2421
	SATURN E.	89 20 42	2032	87 27 57	2023	85 34 59	2016	83 41 49	2009
23	Spica W.	80 36 42	2023	82 29 40	2021	84 22 42	2019	86 15 47	2018
	Antares W.	35 2 58	2122	36 53 24	2108	38 44 11	2097	40 35 15	2087
	Fomalhaut E.	53 5 44	2337	51 20 38	2333	49 35 55	2372	47 51 40	2396
	α Pegasi E.	69 59 18	2440	68 16 40	2449	66 34 15	2461	64 52 7	2476
	SATURN E.	74 13 39	1986	72 19 42	1983	70 25 40	1981	68 31 35	1980
	α Arietis E.	112 41 48	2166	110 52 29	2159	109 2 59	2153	107 13 20	2149

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
24	Spica W.	88 8 53	2017	90 2 0	2018	91 55 6	2019	93 48 10	2021
	Antares W.	42 26 34	2079	44 18 5	2073	46 9 45	2069	48 1 32	2066
	Fomalhaut E.	46 7 59	2423	44 24 56	2454	42 42 38	2490	41 1 11	2533
	α Pegasi E.	63 10 20	2492	61 28 55	2511	59 47 57	2533	58 7 30	2559
	SATURN E.	66 37 29	1980	64 43 23	1981	62 49 17	1982	60 55 14	1984
	α Arietis E.	105 23 35	2145	103 33 45	2143	101 43 52	2142	99 53 57	2143
25	Spica W.	103 12 13	2045	105 4 37	2053	106 56 49	2061	108 48 49	2069
	Antares W.	57 20 54	2070	59 12 39	2075	61 4 17	2080	62 55 48	2086
	α Pegasi E.	49 55 35	2743	48 19 52	2794	46 45 16	2852	45 11 55	2916
	SATURN E.	51 26 13	2007	49 32 49	2014	47 39 36	2021	45 46 35	2030
	α Arietis E.	90 45 1	2160	88 55 33	2167	87 6 16	2175	85 17 10	2184
	Aldebaran E.	122 22 57	2010	120 29 38	2017	118 36 30	2024	116 43 33	2032
26	Antares W.	72 10 32	2130	74 0 46	2141	75 50 43	2152	77 40 23	2164
	SATURN E.	36 25 10	2083	34 33 45	2096	32 42 40	2110	30 51 56	2125
	α Arietis E.	76 15 33	2243	74 28 10	2258	72 41 9	2274	70 54 31	2291
	Aldebaran E.	107 22 13	2081	105 30 45	2093	103 39 37	2106	101 48 47	2119
27	Antares W.	86 43 44	2236	88 31 18	2252	90 18 28	2268	92 5 15	2285
	α Aquilæ W.	46 56 43	3502	48 17 5	3446	49 38 30	3397	51 0 50	3354
	α Arietis E.	62 8 5	2391	60 24 17	2415	58 41 3	2439	56 58 24	2465
	Aldebaran E.	92 39 53	2192	90 51 14	2208	89 2 59	2225	87 15 8	2241
28	Antares W.	100 52 47	2375	102 36 58	2394	104 20 42	2412	106 3 59	2431
	α Aquilæ W.	58 2 29	3225	59 28 10	3211	60 54 6	3200	62 20 15	3192
	α Arietis E.	48 34 47	2615	46 56 12	2650	45 18 24	2687	43 41 26	2727
	Aldebaran E.	78 22 12	2329	76 36 55	2348	74 52 5	2366	73 7 41	2384
	SUN E.	134 18 10	2633	132 40 0	2652	131 2 16	2672	129 24 58	2692
29	α Aquilæ W.	69 32 25	3187	70 58 50	3192	72 25 9	3198	73 51 22	3204
	Fomalhaut W.	34 12 3	3198	35 38 15	3160	37 5 12	3129	38 32 47	3104
	Aldebaran E.	64 32 23	2479	62 50 40	2497	61 9 23	2516	59 28 31	2535
	SUN E.	121 25 10	2792	119 50 33	2812	118 16 21	2832	116 42 36	2852
30	α Aquilæ W.	80 59 53	3255	82 24 57	3269	83 49 45	3282	85 14 18	3296
	Fomalhaut W.	45 56 29	3041	47 25 51	3038	48 55 17	3036	50 24 45	3035
	α Pegasi W.	34 44 47	4089	35 54 59	3995	37 6 44	3913	38 19 51	3843
	SATURN W.	20 8 11	2642	21 46 9	2656	23 23 48	2671	25 1 7	2686
	Aldebaran E.	51 10 40	2626	49 32 21	2644	47 54 26	2662	46 16 55	2679
	SUN E.	109 0 11	2951	107 28 57	2970	105 58 7	2989	104 27 41	3008
31	α Aquilæ W.	92 12 37	3377	93 35 20	3394	94 57 43	3413	96 19 45	3432
	Fomalhaut W.	57 51 37	3053	59 20 44	3059	60 49 43	3065	62 18 35	3073
	α Pegasi W.	44 40 38	3610	45 59 1	3581	47 17 56	3556	48 37 18	3534
	SATURN W.	33 2 50	2758	34 38 13	2773	36 13 16	2787	37 48 0	2801
	Aldebaran E.	38 15 4	2763	36 39 48	2779	35 4 53	2795	33 30 18	2810
	SUN E.	97 1 9	3097	95 32 56	3114	94 5 3	3130	92 37 30	3147



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
24	Spica W.	95 41 11	2024	97 34 7	2028	99 26 57	2033	101 19 39	2039
	Antares W.	49 53 23	2065	51 45 16	2064	53 37 10	2065	55 29 3	2066
	Fomalhaut E.	39 20 44	2583	37 41 25	2639	36 3 23	2705	34 26 50	2782
	α Pegasi E.	56 27 39	2588	54 48 27	2619	53 9 58	2656	51 32 19	2697
	SATURN E.	59 1 14	1987	57 7 19	1990	55 13 29	1995	53 19 47	2000
	α Arietis E.	98 4 2	2144	96 14 10	2146	94 24 21	2150	92 34 38	2154
25	Spica W.	110 40 36	2079	112 32 8	2090	114 23 22	2101	116 14 19	2113
	Antares W.	64 47 9	2093	66 38 19	2101	68 29 17	2109	70 20 2	2119
	α Pegasi E.	43 39 56	2988	42 9 28	3069	40 40 41	3161	39 13 45	3265
	SATURN E.	43 53 47	2039	42 1 14	2049	40 8 56	2059	38 16 54	2071
	α Arietis E.	83 28 18	2194	81 39 41	2204	79 51 20	2216	78 3 17	2229
	Aldebaran E.	114 50 48	2040	112 58 16	2050	111 6 0	2060	109 13 59	2070
26	Antares W.	79 29 45	2177	81 18 47	2192	83 7 27	2206	84 55 46	2220
	SATURN E.	29 1 35	2140	27 11 37	2157	25 22 5	2175	23 32 59	2193
	α Arietis E.	69 8 18	2309	67 22 32	2328	65 37 13	2348	63 52 24	2369
	Aldebaran E.	99 58 17	2133	98 8 8	2147	96 18 21	2162	94 28 56	2177
27	Antares W.	93 51 37	2302	95 37 33	2320	97 23 4	2338	99 8 9	2356
	α Aquilæ W.	52 23 59	3319	53 47 49	3288	55 12 14	3263	56 37 9	3242
	α Arietis E.	55 16 21	2492	53 34 56	2520	51 54 11	2550	50 14 7	2582
	Aldebaran E.	85 27 41	2258	83 40 40	2276	81 54 5	2294	80 7 56	2311
28	Antares W.	107 46 49	2451	109 29 10	2471	111 11 4	2491	112 52 29	2511
	α Aquilæ W.	63 46 34	3187	65 12 59	3184	66 39 27	3183	68 5 57	3184
	α Arietis E.	42 5 22	2770	40 30 14	2815	38 56 6	2864	37 23 1	2916
	Aldebaran E.	71 23 44	2403	69 40 14	2422	67 57 11	2441	66 14 34	2460
	SUN E.	127 48 7	2712	126 11 43	2732	124 35 45	2752	123 0 14	2772
29	α Aquilæ W.	75 17 26	3213	76 43 20	3222	78 9 3	3232	79 34 35	3243
	Fomalhaut W.	40 0 52	3083	41 29 22	3068	42 58 11	3056	44 27 15	3047
	Aldebaran E.	57 48 6	2553	56 8 7	2572	54 28 33	2590	52 49 24	2608
	SUN E.	115 9 16	2873	113 36 22	2893	112 3 54	2912	110 31 50	2931
30	α Aquilæ W.	86 38 34	3312	88 2 32	3327	89 26 12	3343	90 49 34	3359
	Fomalhaut W.	51 54 14	3038	53 23 40	3040	54 53 4	3043	56 22 23	3047
	α Pegasi W.	39 34 9	3782	40 49 30	3728	42 5 47	3683	43 22 52	3645
	SATURN W.	26 38 6	2700	28 14 46	2714	29 51 7	2729	31 27 8	2744
	Aldebaran E.	44 39 47	2697	43 3 3	2713	41 26 41	2730	39 50 42	2747
	SUN E.	102 57 38	3026	101 27 58	3043	99 58 40	3061	98 29 44	3079
31	α Aquilæ W.	97 41 26	3451	99 2 45	3470	100 23 43	3490	101 44 18	3511
	Fomalhaut W.	63 47 18	3080	65 15 52	3088	66 44 17	3096	68 12 32	3103
	α Pegasi W.	49 57 5	3515	51 17 12	3500	52 37 36	3487	53 58 16	3475
	SATURN W.	39 22 27	2815	40 56 36	2828	42 30 27	2841	44 4 1	2854
	Aldebaran E.	31 56 3	2825	30 22 8	2840	28 48 32	2855	27 15 15	2869
	SUN E.	91 10 17	3163	89 43 23	3178	88 16 47	3192	86 50 28	3207

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent, Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.				
Thur.	1	<sup>h</sup> 8 <sup>m</sup> 41 <sup>s</sup> 58.69	<sup>s</sup> 9.733	N. 18° 15' 22.8	" - 37.08	' 15 47.37	<sup>s</sup> 66.69	<sup>m</sup> 6 <sup>s</sup> 10.97	<sup>s</sup> 0.124	
Frid.	2	8 45 51.98	9.709	18 0 23.8	37.82	15 47.49	66.60	6 7.72	0.148	
Sat.	3	8 49 44.67	9.684	17 45 7.1	38.56	15 47.61	66.52	6 3.85	0.173	
SUN.	4	8 53 36.79	9.659	17 29 33.0	- 39.28	15 47.74	66.43	5 59.43	0.197	
Mon.	5	8 57 28.31	9.633	17 13 41.8	39.98	15 47.87	66.34	5 54.40	0.222	
Tues.	6	9 1 19.23	9.608	16 57 33.8	40.68	15 48.01	66.25	5 48.79	0.246	
Wed.	7	9 5 9.57	9.584	16 41 9.5	- 41.36	15 48.15	66.16	5 42.58	0.271	
Thur.	8	9 8 59.32	9.560	16 24 28.8	42.03	15 48.30	66.07	5 35.80	0.295	
Frid.	9	9 12 48.48	9.535	16 7 32.2	42.69	15 48.45	65.98	5 28.42	0.320	
Sat.	10	9 16 37.04	9.510	15 50 20.1	- 43.33	15 48.60	65.90	5 20.46	0.344	
SUN.	11	9 20 25.02	9.485	15 32 52.7	43.96	15 48.76	65.82	5 11.92	0.368	
Mon.	12	9 24 12.43	9.461	15 15 10.5	44.58	15 48.92	65.74	5 2.79	0.392	
Tues.	13	9 27 59.26	9.438	14 57 13.5	- 45.19	15 49.09	65.66	4 53.09	0.416	
Wed.	14	9 31 45.51	9.415	14 39 2.3	45.77	15 49.27	65.58	4 42.82	0.440	
Thur.	15	9 35 31.20	9.392	14 20 37.1	46.34	15 49.45	65.50	4 31.98	0.463	
Frid.	16	9 39 16.33	9.369	14 1 58.3	- 46.90	15 49.63	65.43	4 20.59	0.486	
Sat.	17	9 43 0.91	9.347	13 43 6.1	47.45	15 49.81	65.35	4 8.65	0.509	
SUN.	18	9 46 44.95	9.324	13 24 0.9	47.98	15 50.00	65.28	3 56.16	0.531	
Mon.	19	9 50 28.46	9.302	13 4 43.1	- 48.50	15 50.19	65.20	3 43.16	0.553	
Tues.	20	9 54 11.45	9.281	12 45 12.8	49.01	15 50.38	65.13	3 29.62	0.574	
Wed.	21	9 57 53.94	9.261	12 25 30.6	49.50	15 50.58	65.06	3 15.60	0.594	
Thur.	22	10 1 35.95	9.241	12 5 36.7	- 49.98	15 50.78	64.99	3 1.10	0.614	
Frid.	23	10 5 17.48	9.221	11 45 31.3	50.45	15 50.98	64.92	2 46.11	0.633	
Sat.	24	10 8 58.58	9.203	11 25 14.7	50.91	15 51.18	64.86	2 30.70	0.651	
SUN.	25	10 12 39.24	9.186	11 4 47.3	- 51.35	15 51.38	64.79	2 14.86	0.669	
Mon.	26	10 16 19.50	9.169	10 44 9.3	51.79	15 51.59	64.73	1 58.60	0.686	
Tues.	27	10 19 59.36	9.153	10 23 21.1	52.21	15 51.80	64.67	1 41.95	0.702	
Wed.	28	10 23 38.84	9.137	10 2 22.9	- 52.62	15 52.01	64.61	1 24.92	0.717	
Thur.	29	10 27 17.95	9.122	9 41 15.2	53.02	15 52.22	64.55	1 7.53	0.732	
Frid.	30	10 30 56.72	9.109	9 19 58.1	53.40	15 52.43	64.50	0 49.80	0.746	
Sat.	31	10 34 35.16	9.095	8 58 32.0	53.77	15 52.64	64.45	0 31.74	0.759	
SUN.	32	10 38 13.30	9.083	N. 8 36 57.1	- 54.13	15 52.86	64.41	0 13.36	0.771	

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0<sup>s</sup>.18 from the sidereal time.  
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
Thur.	1	h m s 8 41 57.70	s 9.733	N. 18 15 26.6	" -37.08	m s 6 10.98	s 0.124	h m s 8 35 46.72
Frid.	2	8 45 51.00	9.709	18 0 27.6	37.82	6 7.73	0.148	8 39 43.27
Sat.	3	8 49 43.70	9.684	17 45 11.0	38.56	6 3.87	0.173	8 43 39.83
SUN.	4	8 53 35.83	9.659	17 29 36.9	-39.28	5 59.45	0.197	8 47 36.38
Mon.	5	8 57 27.36	9.634	17 13 45.8	39.98	5 54.42	0.222	8 51 32.94
Tues.	6	9 1 18.31	9.609	16 57 37.8	40.68	5 48.82	0.246	8 55 29.49
Wed.	7	9 5 8.66	9.585	16 41 13.4	-41.36	5 42.61	0.271	8 59 26.05
Thur.	8	9 8 58.43	9.561	16 24 32.7	42.03	5 35.83	0.295	9 3 22.60
Frid.	9	9 12 47.61	9.536	16 7 36.1	42.69	5 28.45	0.320	9 7 19.16
Sat.	10	9 16 36.20	9.511	15 50 24.0	-43.33	5 20.49	0.344	9 11 15.71
SUN.	11	9 20 24.21	9.486	15 32 56.5	43.96	5 11.95	0.368	9 15 12.26
Mon.	12	9 24 11.64	9.462	15 15 14.2	44.58	5 2.82	0.392	9 19 8.82
Tues.	13	9 27 58.50	9.439	14 57 17.1	-45.19	4 53.12	0.416	9 23 5.38
Wed.	14	9 31 44.78	9.416	14 39 5.8	45.77	4 42.85	0.440	9 27 1.93
Thur.	15	9 35 30.50	9.393	14 20 40.5	46.34	4 32.02	0.463	9 30 58.48
Frid.	16	9 39 15.66	9.370	14 2 1.6	-46.90	4 20.62	0.486	9 34 55.04
Sat.	17	9 43 0.27	9.347	13 43 9.3	47.45	4 8.68	0.509	9 38 51.59
SUN.	18	9 46 44.34	9.325	13 24 4.0	47.98	3 56.19	0.531	9 42 48.15
Mon.	19	9 50 27.89	9.304	13 4 46.1	-48.50	3 43.19	0.553	9 46 44.70
Tues.	20	9 54 10.91	9.283	12 45 15.7	49.01	3 29.65	0.574	9 50 41.26
Wed.	21	9 57 53.44	9.263	12 25 33.3	49.51	3 15.63	0.594	9 54 37.81
Thur.	22	10 1 35.49	9.243	12 5 39.2	-49.99	3 1.13	0.614	9 58 34.36
Frid.	23	10 5 17.06	9.223	11 45 33.6	50.46	2 46.14	0.633	10 2 30.92
Sat.	24	10 8 58.20	9.205	11 25 16.8	50.92	2 30.73	0.651	10 6 27.47
SUN.	25	10 12 38.90	9.187	11 4 49.2	-51.36	2 14.88	0.669	10 10 24.02
Mon.	26	10 16 19.20	9.171	10 44 11.0	51.80	1 58.62	0.686	10 14 20.58
Tues.	27	10 19 59.09	9.155	10 23 22.6	52.22	1 41.96	0.702	10 18 17.13
Wed.	28	10 23 38.62	9.139	10 2 24.2	-52.63	1 24.94	0.717	10 22 13.68
Thur.	29	10 27 17.78	9.125	9 41 16.2	53.03	1 7.54	0.732	10 26 10.24
Frid.	30	10 30 56.60	9.111	9 19 58.8	53.41	0 49.81	0.746	10 30 6.79
Sat.	31	10 34 35.09	9.099	8 58 32.4	53.78	0 31.75	0.759	10 34 3.34
SUN.	32	10 38 13.27	9.085	N. 8 36 57.3	-54.14	0 13.37	0.771	10 37 59.90

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,  
+ 9<sup>s</sup>.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	213	128 4 34.6	4 20.4	143.52	— 0.76	0.006 4252	— 21.9	h m s 15 21 41.87
2	214	129 1 59.7	1 45.3	143.57	0.71	0.006 3717	22.7	15 17 45.96
3	215	129 59 25.9	59 11.4	143.62	0.66	0.006 3162	23.6	15 13 50.05
4	216	130 56 53.2	56 38.6	143.66	— 0.56	0.006 2587	— 24.4	15 9 54.14
5	217	131 54 21.7	54 7.0	143.71	0.46	0.006 1990	25.3	15 5 58.24
6	218	132 51 51.4	51 36.5	143.76	0.34	0.006 1371	26.2	15 2 2.33
7	219	133 49 22.2	49 7.2	143.81	— 0.21	0.006 0730	— 27.2	14 58 6.42
8	220	134 46 54.2	46 39.0	143.86	— 0.08	0.006 0066	28.1	14 54 10.51
9	221	135 44 27.3	44 12.0	143.90	+ 0.04	0.005 9380	29.1	14 50 14.60
10	222	136 42 1.5	41 46.0	143.95	+ 0.14	0.005 8672	— 30.0	14 46 18.69
11	223	137 39 36.7	39 21.1	143.99	0.22	0.005 7941	30.9	14 42 22.78
12	224	138 37 13.0	36 57.3	144.04	0.30	0.005 7188	31.8	14 38 26.87
13	225	139 34 50.3	34 34.5	144.08	+ 0.32	0.005 6414	— 32.7	14 34 30.96
14	226	140 32 28.6	32 12.7	144.12	0.33	0.005 5620	33.5	14 30 35.06
15	227	141 30 7.9	29 51.9	144.16	0.32	0.005 4806	34.3	14 26 39.15
16	228	142 27 48.2	27 32.0	144.20	+ 0.26	0.005 3975	— 35.0	14 22 43.24
17	229	143 25 29.4	25 13.1	144.24	0.18	0.005 3127	35.6	14 18 47.33
18	230	144 23 11.7	22 55.3	144.28	+ 0.07	0.005 2265	36.2	14 14 51.42
19	231	145 20 55.0	20 38.5	144.33	— 0.06	0.005 1390	— 36.7	14 10 55.51
20	232	146 18 39.5	18 22.8	144.38	0.20	0.005 0503	37.1	14 6 59.61
21	233	147 16 25.1	16 8.3	144.43	0.35	0.004 9607	37.5	14 3 3.70
22	234	148 14 11.9	13 55.1	144.48	— 0.48	0.004 8702	— 37.9	13 59 7.79
23	235	149 12 0.1	11 43.2	144.54	0.61	0.004 7789	38.2	13 55 11.88
24	236	150 9 49.8	9 32.8	144.60	0.72	0.004 6868	38.5	13 51 15.97
25	237	151 7 41.1	7 23.9	144.67	— 0.80	0.004 5940	— 38.8	13 47 20.07
26	238	152 5 34.0	5 16.7	144.74	0.85	0.004 5005	39.2	13 43 24.16
27	239	153 3 28.6	3 11.2	144.81	0.88	0.004 4060	39.6	13 39 28.25
28	240	154 1 25.0	1 7.5	144.89	— 0.87	0.004 3106	— 40.0	13 35 32.34
29	241	154 59 23.2	59 5.6	144.97	0.84	0.004 2142	40.4	13 31 36.44
30	242	155 57 23.3	57 5.6	145.04	0.77	0.004 1167	40.9	13 27 40.53
31	243	156 55 25.3	55 7.5	145.12	0.69	0.004 0179	41.4	13 23 44.62
32	244	157 53 29.2	53 11.3	145.20	— 0.58	0.003 9178	— 42.0	13 19 48.72

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,  
— 9<sup>h</sup>.8296.  
(Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	THE MOON'S								
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	' "	' "	' "	"	' "	"	h m	m	d
1	15 9.5	15 4.3	55 31.8	- 1.68	55 12.7	- 1.50	18 45.7	1.90	21.9
2	14 59.7	14 55.8	54 55.9	1.30	54 41.4	1.11	19 31.5	1.93	22.9
3	14 52.5	14 49.8	54 29.2	0.92	54 19.2	0.74	20 18.3	1.97	23.9
4	14 47.6	14 46.2	54 11.5	- 0.56	54 6.0	- 0.38	21 6.1	2.01	24.9
5	14 45.2	14 44.8	54 2.4	- 0.21	54 0.8	- 0.06	21 54.6	2.03	25.9
6	14 44.8	14 45.2	54 0.9	+ 0.07	54 2.7	+ 0.21	22 43.3	2.02	26.9
7	14 46.1	14 47.4	54 6.1	+ 0.34	54 10.8	+ 0.45	23 31.5	1.99	27.9
8	14 49.1	14 51.0	54 16.9	0.55	54 24.1	0.65	6	.	28.9
9	14 53.4	14 56.0	54 32.5	0.74	54 42.0	0.83	0 18.8	1.95	0.2
10	14 58.8	15 1.9	54 52.5	+ 0.91	55 3.9	+ 0.99	1 5.1	1.91	1.2
11	15 5.3	15 8.9	55 16.3	1.07	55 29.6	1.15	1 50.5	1.87	2.2
12	15 12.8	15 16.9	55 43.9	1.23	55 59.0	1.30	2 35.3	1.86	3.2
13	15 21.3	15 26.0	56 15.1	+ 1.38	56 32.2	+ 1.46	3 20.0	1.88	4.2
14	15 30.8	15 35.9	56 50.1	1.53	57 8.8	1.60	4 5.6	1.93	5.2
15	15 41.2	15 46.7	57 28.3	1.65	57 48.4	1.69	4 53.0	2.02	6.2
16	15 52.3	15 57.9	58 9.0	+ 1.72	58 29.7	+ 1.72	5 43.0	2.15	7.2
17	16 3.6	16 9.0	58 50.3	1.70	59 10.5	1.64	6 36.4	2.31	8.2
18	16 14.3	16 19.2	59 29.7	1.55	59 47.7	1.42	7 33.6	2.46	9.2
19	16 23.6	16 27.3	60 3.8	+ 1.25	60 17.6	+ 1.03	8 33.9	2.57	10.2
20	16 30.3	16 32.5	60 28.6	0.78	60 36.4	+ 0.50	9 36.2	2.60	11.2
21	16 33.6	16 33.6	60 40.5	+ 0.16	60 40.8	- 0.18	10 38.3	2.55	12.2
22	16 32.6	16 30.5	60 36.9	- 0.48	60 29.1	- 0.82	11 38.1	2.43	13.2
23	16 27.2	16 23.0	60 17.3	1.13	60 1.9	1.42	12 34.8	2.29	14.2
24	16 18.0	16 12.1	59 43.1	1.68	59 21.6	1.88	13 28.0	2.15	15.2
25	16 5.7	15 58.7	58 58.0	- 2.05	58 32.5	- 2.15	14 18.3	2.04	16.2
26	15 51.5	15 44.3	58 6.2	2.21	57 39.4	2.23	15 6.4	1.97	17.2
27	15 37.0	15 29.9	57 12.7	2.19	56 46.8	2.12	15 53.3	1.94	18.2
28	15 23.1	15 16.8	56 21.9	- 2.01	55 58.5	- 1.87	16 39.6	1.93	19.2
29	15 10.9	15 5.6	55 37.0	1.71	55 17.5	1.53	17 26.1	1.95	20.2
30	15 0.9	14 56.9	55 0.2	1.34	54 45.4	1.13	18 13.2	1.98	21.2
31	14 53.5	14 50.8	54 33.1	0.93	54 23.2	0.72	19 1.0	2.01	22.2
32	14 48.8	14 47.5	54 15.9	- 0.51	54 11.0	- 0.30	19 49.4	2.02	23.2

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 1.					SATURDAY 3.				
0	2 47 5.21	1.9900	N. 10 53 44.8	10.141	0	4 23 34.08	2.0404	N. 17 43 36.0	6.743
1	2 49 4.62	1.9902	11 3 51.5	10.082	1	4 25 36.55	2.0419	17 50 18.1	6.660
2	2 51 4.04	1.9906	11 13 54.7	10.023	2	4 27 39.11	2.0434	17 56 55.2	6.577
3	2 53 3.49	1.9910	11 23 54.3	9.963	3	4 29 41.76	2.0450	18 3 27.4	6.494
4	2 55 2.96	1.9914	11 33 50.3	9.903	4	4 31 44.51	2.0467	18 9 54.5	6.409
5	2 57 2.46	1.9918	11 43 42.7	9.842	5	4 33 47.36	2.0482	18 16 16.5	6.325
6	2 59 1.98	1.9923	11 53 31.4	9.782	6	4 35 50.30	2.0497	18 22 33.5	6.241
7	3 1 1.54	1.9929	12 3 16.5	9.720	7	4 37 53.33	2.0513	18 28 45.4	6.155
8	3 3 1.13	1.9935	12 12 57.8	9.657	8	4 39 56.46	2.0530	18 34 52.1	6.069
9	3 5 0.76	1.9941	12 22 35.3	9.593	9	4 41 59.69	2.0546	18 40 53.7	5.983
10	3 7 0.42	1.9947	12 32 9.0	9.530	10	4 44 3.01	2.0562	18 46 50.1	5.897
11	3 9 0.13	1.9955	12 41 38.9	9.467	11	4 46 6.43	2.0577	18 52 41.3	5.810
12	3 10 59.88	1.9962	12 51 5.0	9.402	12	4 48 9.94	2.0593	18 58 27.3	5.723
13	3 12 59.67	1.9969	13 0 27.2	9.337	13	4 50 13.55	2.0609	19 4 8.1	5.635
14	3 14 59.51	1.9977	13 9 45.4	9.271	14	4 52 17.25	2.0625	19 9 43.5	5.547
15	3 16 59.40	1.9986	13 18 59.7	9.206	15	4 54 21.05	2.0641	19 15 13.7	5.459
16	3 18 59.34	1.9994	13 28 10.1	9.139	16	4 56 24.94	2.0657	19 20 38.6	5.370
17	3 20 59.33	2.0003	13 37 16.4	9.071	17	4 58 28.93	2.0672	19 25 58.1	5.280
18	3 22 59.38	2.0012	13 46 18.6	9.003	18	5 0 33.01	2.0688	19 31 12.2	5.190
19	3 24 59.48	2.0022	13 55 16.8	8.936	19	5 2 37.19	2.0704	19 36 20.9	5.100
20	3 26 59.64	2.0032	14 4 10.9	8.867	20	5 4 41.46	2.0719	19 41 24.2	5.010
21	3 28 59.86	2.0042	14 13 0.8	8.797	21	5 6 45.82	2.0734	19 46 22.1	4.919
22	3 31 0.15	2.0053	14 21 46.6	8.727	22	5 8 50.27	2.0750	19 51 14.5	4.827
23	3 33 0.50	2.0063	N. 14 30 28.1	8.657	23	5 10 54.82	2.0766	N. 19 56 1.4	4.736
FRIDAY 2.					SUNDAY 4.				
0	3 35 0.91	2.0074	N. 14 39 5.5	8.587	0	5 12 59.46	2.0781	N. 20 0 42.8	4.644
1	3 37 1.39	2.0086	14 47 38.6	8.516	1	5 15 4.19	2.0796	20 5 18.7	4.552
2	3 39 1.94	2.0097	14 56 7.4	8.444	2	5 17 9.01	2.0811	20 9 49.0	4.459
3	3 41 2.56	2.0109	15 4 31.9	8.372	3	5 19 13.92	2.0826	20 14 13.8	4.366
4	3 43 3.25	2.0121	15 12 52.0	8.298	4	5 21 18.92	2.0840	20 18 32.9	4.272
5	3 45 4.01	2.0133	15 21 7.7	8.225	5	5 23 24.00	2.0854	20 22 46.5	4.179
6	3 47 4.85	2.0147	15 29 19.0	8.152	6	5 25 29.17	2.0869	20 26 54.4	4.085
7	3 49 5.77	2.0159	15 37 25.9	8.078	7	5 27 34.43	2.0883	20 30 56.7	3.990
8	3 51 6.76	2.0172	15 45 28.4	8.003	8	5 29 39.77	2.0897	20 34 53.2	3.895
9	3 53 7.83	2.0185	15 53 26.3	7.927	9	5 31 45.20	2.0912	20 38 44.1	3.801
10	3 55 8.98	2.0198	16 1 19.7	7.852	10	5 33 50.71	2.0925	20 42 29.3	3.706
11	3 57 10.21	2.0212	16 9 8.5	7.776	11	5 35 56.30	2.0938	20 46 8.8	3.610
12	3 59 11.53	2.0227	16 16 52.8	7.700	12	5 38 1.97	2.0952	20 49 42.5	3.514
13	4 1 12.93	2.0240	16 24 32.5	7.622	13	5 40 7.72	2.0965	20 53 10.5	3.417
14	4 3 14.41	2.0254	16 32 7.5	7.544	14	5 42 13.55	2.0977	20 56 32.6	3.321
15	4 5 15.98	2.0268	16 39 37.8	7.466	15	5 44 19.45	2.0990	20 59 49.0	3.225
16	4 7 17.63	2.0282	16 47 3.4	7.387	16	5 46 25.43	2.1003	21 2 59.6	3.127
17	4 9 19.37	2.0297	16 54 24.3	7.309	17	5 48 31.49	2.1016	21 6 4.3	3.029
18	4 11 21.20	2.0312	17 1 40.5	7.230	18	5 50 37.62	2.1027	21 9 3.1	2.932
19	4 13 23.12	2.0327	17 8 51.9	7.149	19	5 52 43.82	2.1039	21 11 56.1	2.834
20	4 15 25.13	2.0342	17 15 58.4	7.068	20	5 54 50.09	2.1050	21 14 43.2	2.737
21	4 17 27.23	2.0357	17 23 0.1	6.988	21	5 56 56.42	2.1061	21 17 24.5	2.638
22	4 19 29.42	2.0372	17 29 57.0	6.907	22	5 59 2.82	2.1072	21 19 59.8	2.538
23	4 21 31.70	2.0388	17 36 48.9	6.825	23	6 1 9.29	2.1083	21 22 29.1	2.439
24	4 23 34.08	2.0404	N. 17 43 36.0	6.743	24	6 3 15.82	2.1093	N. 21 24 52.5	2.341

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 5.					WEDNESDAY 7.				
0	h m s	s	N. 21 24 52.5	2.341	0	h m s	s	N. 21 20 35.8	2.530
1	6 3 15.82	2.1093	21 27 10.0	2.242	1	7 45 5.29	2.1195	21 18 1.0	2.630
2	6 5 22.41	2.1104	21 29 21.5	2.142	2	7 47 12.44	2.1188	21 15 20.2	2.731
3	6 7 29.07	2.1114	21 31 27.0	2.042	3	7 49 19.55	2.1181	21 12 33.3	2.831
4	6 9 35.78	2.1123	21 33 26.6	1.942	4	7 51 26.61	2.1173	21 9 40.5	2.930
5	6 11 42.55	2.1132	21 35 20.1	1.842	5	7 53 33.63	2.1166	21 6 41.7	3.030
6	6 13 49.37	2.1141	21 37 7.6	1.742	6	7 55 40.60	2.1157	21 3 36.9	3.129
7	6 15 56.24	2.1150	21 38 49.1	1.642	7	7 57 47.52	2.1148	21 0 26.2	3.228
8	6 18 3.17	2.1159	21 40 24.6	1.541	8	7 59 54.38	2.1139	20 57 9.5	3.327
9	6 20 10.15	2.1167	21 41 54.0	1.439	9	8 2 1.19	2.1131	20 53 46.9	3.426
10	6 22 17.17	2.1174	21 43 17.3	1.338	10	8 4 7.95	2.1122	20 50 18.4	3.524
11	6 24 24.24	2.1182	21 44 34.6	1.237	11	8 6 14.65	2.1112	20 46 44.0	3.622
12	6 26 31.35	2.1188	21 45 45.9	1.137	12	8 8 21.29	2.1102	20 43 3.7	3.721
13	6 28 38.50	2.1195	21 46 51.1	1.035	13	8 10 27.87	2.1091	20 39 17.5	3.818
14	6 30 45.69	2.1202	21 47 50.1	0.933	14	8 12 34.38	2.1080	20 35 25.5	3.915
15	6 32 52.92	2.1207	21 48 43.1	0.832	15	8 14 40.83	2.1070	20 31 27.7	4.012
16	6 35 0.18	2.1213	21 49 29.9	0.730	16	8 16 47.22	2.1058	20 27 24.1	4.108
17	6 37 7.48	2.1219	21 50 10.7	0.628	17	8 18 53.53	2.1046	20 23 14.7	4.205
18	6 39 14.81	2.1224	21 50 45.3	0.527	18	8 20 59.77	2.1034	20 18 59.5	4.301
19	6 41 22.17	2.1228	21 51 13.9	0.425	19	8 23 5.94	2.1022	20 14 38.6	4.397
20	6 43 29.55	2.1232	21 51 36.3	0.322	20	8 25 12.04	2.1010	20 10 11.9	4.492
21	6 45 36.96	2.1237	21 51 52.5	0.220	21	8 27 18.06	2.0997	20 5 39.6	4.587
22	6 47 44.39	2.1240	21 52 2.7	0.118	22	8 29 24.01	2.0985	20 1 1.5	4.682
23	6 49 51.84	2.1243	N. 21 52 6.7	+0.016	23	8 31 29.88	2.0972	N. 19 56 17.8	4.775
24	6 51 59.31	2.1246			24	8 33 35.67	2.0957		
TUESDAY 6.					THURSDAY 8.				
0	6 54 6.79	2.1248	N. 21 52 4.6	-0.086	0	8 35 41.37	2.0943	N. 19 51 28.5	4.869
1	6 56 14.29	2.1251	21 51 56.4	0.188	1	8 37 46.99	2.0930	19 46 33.5	4.962
2	6 58 21.80	2.1252	21 51 42.0	0.291	2	8 39 52.53	2.0916	19 41 33.0	5.056
3	7 0 29.32	2.1253	21 51 21.5	0.393	3	8 41 57.98	2.0902	19 36 26.8	5.149
4	7 2 36.84	2.1254	21 50 54.8	0.496	4	8 44 3.35	2.0887	19 31 15.1	5.241
5	7 4 44.37	2.1255	21 50 22.0	0.598	5	8 46 8.63	2.0872	19 25 57.9	5.332
6	7 6 51.90	2.1255	21 49 43.0	0.701	6	8 48 13.82	2.0857	19 20 35.2	5.424
7	7 8 59.43	2.1255	21 48 57.9	0.802	7	8 50 18.92	2.0842	19 15 7.0	5.515
8	7 11 6.96	2.1254	21 48 6.7	0.904	8	8 52 23.93	2.0827	19 9 33.4	5.606
9	7 13 14.48	2.1253	21 47 9.4	1.007	9	8 54 28.85	2.0812	19 3 54.3	5.696
10	7 15 22.00	2.1252	21 46 5.9	1.109	10	8 56 33.68	2.0797	18 58 9.9	5.786
11	7 17 29.51	2.1251	21 44 56.3	1.212	11	8 58 38.41	2.0780	18 52 20.0	5.876
12	7 19 37.01	2.1248	21 43 40.5	1.314	12	9 0 43.04	2.0764	18 46 24.8	5.964
13	7 21 44.49	2.1246	21 42 18.6	1.415	13	9 2 47.58	2.0748	18 40 24.3	6.052
14	7 23 51.95	2.1243	21 40 50.7	1.517	14	9 4 52.02	2.0732	18 34 18.5	6.140
15	7 25 59.41	2.1240	21 39 16.6	1.619	15	9 6 56.36	2.0716	18 28 7.5	6.227
16	7 28 6.84	2.1237	21 37 36.4	1.721	16	9 9 0.61	2.0700	18 21 51.2	6.315
17	7 30 14.25	2.1232	21 35 50.1	1.822	17	9 11 4.76	2.0682	18 15 29.7	6.401
18	7 32 21.63	2.1228	21 33 57.7	1.924	18	9 13 8.80	2.0666	18 9 3.1	6.487
19	7 34 28.99	2.1224	21 31 59.2	2.025	19	9 15 12.75	2.0650	18 2 31.3	6.572
20	7 36 36.32	2.1218	21 29 54.7	2.127	20	9 17 16.60	2.0632	17 55 54.4	6.657
21	7 38 43.61	2.1212	21 27 44.0	2.223	21	9 19 20.34	2.0615	17 49 12.4	6.742
22	7 40 50.87	2.1207	21 25 27.3	2.328	22	9 21 23.98	2.0598	17 42 25.4	6.826
23	7 42 58.10	2.1202	21 23 4.6	2.429	23	9 23 27.52	2.0582	17 35 33.3	6.909
24	7 45 5.29	2.1195	N. 21 20 35.8	2.530	24	9 25 30.96	2.0564	N. 17 28 36.3	6.992

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 9.					SUNDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	9 25 30.96	2.0564	N. 17 28 36.3	6.992	0	11 2 20.15	1.9832	N. 10 28 43.7	10.258
1	9 27 34.29	2.0547	17 21 34.3	7.074	1	11 4 19.11	1.9822	10 18 26.6	10.310
2	9 29 37.52	2.0530	17 14 27.4	7.156	2	11 6 18.01	1.9813	10 8 6.5	10.362
3	9 31 40.65	2.0512	17 7 15.6	7.237	3	11 8 16.86	1.9803	9 57 43.2	10.412
4	9 33 43.67	2.0495	16 59 58.9	7.318	4	11 10 15.65	1.9793	9 47 17.0	10.462
5	9 35 46.59	2.0478	16 52 37.4	7.398	5	11 12 14.38	1.9784	9 36 47.8	10.511
6	9 37 49.41	2.0461	16 45 11.1	7.477	6	11 14 13.06	1.9776	9 26 15.7	10.559
7	9 39 52.12	2.0443	16 37 40.1	7.556	7	11 16 11.69	1.9767	9 15 40.7	10.607
8	9 41 54.73	2.0426	16 30 4.4	7.635	8	11 18 10.27	1.9760	9 5 2.9	10.653
9	9 43 57.23	2.0408	16 22 23.9	7.713	9	11 20 8.81	1.9752	8 54 22.3	10.699
10	9 45 59.63	2.0392	16 14 38.8	7.790	10	11 22 7.30	1.9745	8 43 39.0	10.744
11	9 48 1.93	2.0374	16 6 49.1	7.867	11	11 24 5.75	1.9738	8 32 53.0	10.789
12	9 50 4.12	2.0357	15 58 54.8	7.942	12	11 26 4.16	1.9732	8 22 4.3	10.833
13	9 52 6.21	2.0340	15 50 56.0	8.018	13	11 28 2.53	1.9726	8 11 13.0	10.876
14	9 54 8.20	2.0322	15 42 52.6	8.093	14	11 30 0.87	1.9721	8 0 19.2	10.918
15	9 56 10.08	2.0305	15 34 44.8	8.167	15	11 31 59.18	1.9716	7 49 22.8	10.961
16	9 58 11.86	2.0289	15 26 32.5	8.242	16	11 33 57.46	1.9711	7 38 23.9	11.002
17	10 0 13.55	2.0272	15 18 15.8	8.315	17	11 35 55.71	1.9707	7 27 22.6	11.042
18	10 2 15.13	2.0255	15 9 54.7	8.387	18	11 37 53.94	1.9702	7 16 18.9	11.081
19	10 4 16.61	2.0238	15 1 29.4	8.458	19	11 39 52.14	1.9698	7 5 12.9	11.120
20	10 6 17.99	2.0222	14 52 59.7	8.531	20	11 41 50.32	1.9696	6 54 4.5	11.158
21	10 8 19.27	2.0205	14 44 25.7	8.601	21	11 43 48.49	1.9693	6 42 53.9	11.195
22	10 10 20.45	2.0189	14 35 47.6	8.670	22	11 45 46.64	1.9691	6 31 41.1	11.232
23	10 12 21.54	2.0173	N. 14 27 5.3	8.740	23	11 47 44.78	1.9689	N. 6 20 26.1	11.267
SATURDAY 10.					MONDAY 12.				
0	10 14 22.53	2.0157	N. 14 18 18.8	8.808	0	11 49 42.91	1.9687	N. 6 9 9.0	11.302
1	10 16 23.42	2.0141	14 9 28.3	8.877	1	11 51 41.03	1.9687	5 57 49.8	11.337
2	10 18 24.22	2.0126	14 0 33.6	8.944	2	11 53 39.15	1.9687	5 46 28.6	11.370
3	10 20 24.93	2.0110	13 51 35.0	9.011	3	11 55 37.27	1.9687	5 35 5.4	11.402
4	10 22 25.54	2.0094	13 42 32.3	9.077	4	11 57 35.39	1.9687	5 23 40.3	11.434
5	10 24 26.06	2.0079	13 33 25.7	9.142	5	11 59 33.52	1.9688	5 12 13.3	11.466
6	10 26 26.49	2.0064	13 24 15.2	9.207	6	12 1 31.65	1.9689	5 0 44.4	11.496
7	10 28 26.83	2.0049	13 15 0.8	9.272	7	12 3 29.79	1.9692	4 49 13.8	11.525
8	10 30 27.08	2.0034	13 5 42.6	9.335	8	12 5 27.95	1.9695	4 37 41.4	11.555
9	10 32 27.24	2.0020	12 56 20.6	9.397	9	12 7 26.13	1.9697	4 26 7.2	11.583
10	10 34 27.32	2.0006	12 46 54.9	9.460	10	12 9 24.32	1.9700	4 14 31.4	11.610
11	10 36 27.31	1.9992	12 37 25.4	9.522	11	12 11 22.53	1.9704	4 2 54.0	11.636
12	10 38 27.22	1.9978	12 27 52.3	9.582	12	12 13 20.77	1.9709	3 51 15.1	11.662
13	10 40 27.05	1.9964	12 18 15.6	9.642	13	12 15 19.04	1.9714	3 39 34.6	11.687
14	10 42 26.79	1.9951	12 8 35.2	9.702	14	12 17 17.34	1.9719	3 27 52.7	11.711
15	10 44 26.46	1.9938	11 58 51.4	9.760	15	12 19 15.67	1.9725	3 16 9.3	11.734
16	10 46 26.05	1.9925	11 49 4.0	9.818	16	12 21 14.04	1.9732	3 4 24.6	11.757
17	10 48 25.56	1.9912	11 39 13.2	9.876	17	12 23 12.45	1.9738	2 52 38.5	11.779
18	10 50 25.00	1.9900	11 29 18.9	9.933	18	12 25 10.90	1.9746	2 40 51.1	11.800
19	10 52 24.36	1.9888	11 19 21.2	9.989	19	12 27 9.40	1.9754	2 29 2.5	11.819
20	10 54 23.65	1.9877	11 9 20.2	10.044	20	12 29 7.95	1.9762	2 17 12.8	11.838
21	10 56 22.88	1.9866	10 59 15.9	10.098	21	12 31 6.55	1.9772	2 5 21.9	11.857
22	10 58 22.04	1.9854	10 49 8.4	10.152	22	12 33 5.21	1.9782	1 53 29.9	11.876
23	11 0 21.13	1.9842	10 38 57.6	10.206	23	12 35 3.93	1.9792	1 41 36.8	11.892
24	11 2 20.15	1.9832	N. 10 28 43.7	10.258	24	12 37 2.71	1.9802	N. 1 29 42.8	11.907



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 13.					THURSDAY 15.				
0	12 37 2.71	1.9802	N. 1 29 42.8	11.907	0	14 14 25.93	2.1004	S. 8 3 44.1	11.627
1	12 39 1.56	1.9813	1 17 47.9	11.923	1	14 16 32.07	2.1043	8 15 20.8	11.597
2	12 41 0.47	1.9825	1 5 52.0	11.938	2	14 18 38.45	2.1084	8 26 55.7	11.565
3	12 42 59.46	1.9838	0 53 55.3	11.951	3	14 20 45.08	2.1125	8 38 28.6	11.532
4	12 44 58.53	1.9852	0 41 57.9	11.963	4	14 22 51.95	2.1166	8 49 59.6	11.500
5	12 46 57.68	1.9865	0 29 59.7	11.976	5	14 24 59.07	2.1207	9 1 28.6	11.466
6	12 48 56.91	1.9878	0 18 0.8	11.987	6	14 27 6.44	2.1250	9 12 55.5	11.430
7	12 50 56.22	1.9892	N. 0 6 1.2	11.997	7	14 29 14.07	2.1293	9 24 20.2	11.393
8	12 52 55.62	1.9908	S. 0 5 58.9	12.006	8	14 31 21.96	2.1337	9 35 42.7	11.356
9	12 54 55.12	1.9925	0 17 59.5	12.015	9	14 33 30.11	2.1381	9 47 2.9	11.317
10	12 56 54.72	1.9941	0 30 0.7	12.022	10	14 35 38.53	2.1426	9 58 20.8	11.277
11	12 58 54.41	1.9958	0 42 2.2	12.029	11	14 37 47.22	2.1471	10 9 36.2	11.236
12	13 0 54.21	1.9976	0 54 4.2	12.036	12	14 39 56.18	2.1517	10 20 49.1	11.193
13	13 2 54.12	1.9993	1 6 6.5	12.040	13	14 42 5.42	2.1562	10 31 59.4	11.150
14	13 4 54.13	2.0012	1 18 9.0	12.043	14	14 44 14.93	2.1609	10 43 7.1	11.106
15	13 6 54.26	2.0032	1 30 11.7	12.047	15	14 46 24.73	2.1657	10 54 12.1	11.060
16	13 8 54.51	2.0052	1 42 14.7	12.050	16	14 48 34.81	2.1704	11 5 14.3	11.013
17	13 10 54.88	2.0072	1 54 17.7	12.051	17	14 50 45.18	2.1752	11 16 13.6	10.964
18	13 12 55.37	2.0093	2 6 20.8	12.052	18	14 52 55.84	2.1802	11 27 10.0	10.915
19	13 14 55.99	2.0114	2 18 23.9	12.052	19	14 55 6.80	2.1852	11 38 3.4	10.864
20	13 16 56.74	2.0137	2 30 27.0	12.050	20	14 57 18.06	2.1901	11 48 53.7	10.812
21	13 18 57.63	2.0160	2 42 29.9	12.047	21	14 59 29.61	2.1951	11 59 40.9	10.760
22	13 20 58.66	2.0183	2 54 32.7	12.045	22	15 1 41.47	2.2002	12 10 24.9	10.706
23	13 22 59.83	2.0207	S. 3 6 35.3	12.041	23	15 3 53.63	2.2052	S. 12 21 5.6	10.650
WEDNESDAY 14.					FRIDAY 16.				
0	13 25 1.14	2.0231	S. 3 18 37.6	12.036	0	15 6 6.10	2.2104	S. 12 31 42.9	10.593
1	13 27 2.60	2.0257	3 30 39.6	12.030	1	15 8 18.88	2.2157	12 42 16.8	10.553
2	13 29 4.22	2.0283	3 42 41.2	12.023	2	15 10 31.98	2.2209	12 52 47.1	10.476
3	13 31 6.00	2.0309	3 54 42.4	12.016	3	15 12 45.39	2.2262	13 3 13.9	10.416
4	13 33 7.93	2.0336	4 6 43.1	12.007	4	15 14 59.12	2.2315	13 13 37.0	10.354
5	13 35 10.03	2.0364	4 18 43.3	11.998	5	15 17 13.17	2.2368	13 23 56.4	10.291
6	13 37 12.30	2.0392	4 30 42.9	11.987	6	15 19 27.54	2.2422	13 34 11.9	10.226
7	13 39 14.74	2.0421	4 42 41.7	11.975	7	15 21 42.24	2.2477	13 44 23.5	10.160
8	13 41 17.35	2.0450	4 54 39.9	11.963	8	15 23 57.26	2.2532	13 54 31.1	10.093
9	13 43 20.14	2.0481	5 6 37.3	11.950	9	15 26 12.62	2.2587	14 4 34.7	10.026
10	13 45 23.12	2.0512	5 18 33.9	11.935	10	15 28 28.31	2.2642	14 14 34.2	9.956
11	13 47 26.28	2.0543	5 30 29.5	11.920	11	15 30 44.33	2.2698	14 24 29.4	9.885
12	13 49 29.63	2.0574	5 42 24.3	11.904	12	15 33 0.69	2.2754	14 34 20.4	9.813
13	13 51 33.17	2.0607	5 54 18.0	11.886	13	15 35 17.38	2.2811	14 44 7.0	9.739
14	13 53 36.91	2.0640	6 6 10.6	11.867	14	15 37 34.42	2.2868	14 53 49.1	9.664
15	13 55 40.85	2.0674	6 18 2.1	11.848	15	15 39 51.80	2.2925	15 3 26.7	9.588
16	13 57 45.00	2.0708	6 29 52.4	11.827	16	15 42 9.52	2.2982	15 12 59.7	9.511
17	13 59 49.35	2.0742	6 41 41.4	11.806	17	15 44 27.58	2.3039	15 22 28.0	9.432
18	14 1 53.91	2.0778	6 53 29.1	11.783	18	15 46 45.99	2.3097	15 31 51.6	9.352
19	14 3 58.69	2.0815	7 5 15.4	11.760	19	15 49 4.74	2.3154	15 41 10.3	9.270
20	14 6 3.69	2.0852	7 17 0.3	11.736	20	15 51 23.84	2.3212	15 50 24.0	9.187
21	14 8 8.91	2.0888	7 28 43.7	11.710	21	15 53 43.29	2.3271	15 59 32.8	9.103
22	14 10 14.35	2.0926	7 40 25.5	11.682	22	15 56 3.09	2.3330	16 8 36.4	9.017
23	14 12 20.02	2.0965	7 52 5.6	11.655	23	15 58 23.25	2.3388	16 17 34.9	8.931
24	14 14 25.93	2.1004	S. 8 3 44.1	11.627	24	16 0 43.75	2.3446	S. 16 26 28.1	8.842

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 17.					MONDAY 19.				
0	16 0 43.75	2.3446	S. 16 26 28.1	8.842	0	17 59 45.52	2.5984	S. 21 23 45.7	3.064
1	16 3 4.60	2.3505	16 35 16.0	8.752	1	18 2 21.54	2.6022	21 26 45.1	2.916
2	16 5 25.81	2.3564	16 43 58.4	8.662	2	18 4 57.78	2.6058	21 29 35.6	2.767
3	16 7 47.37	2.3623	16 52 35.4	8.569	3	18 7 34.24	2.6094	21 32 17.2	2.617
4	16 10 9.29	2.3682	17 1 6.7	8.475	4	18 10 10.91	2.6128	21 34 49.7	2.466
5	16 12 31.56	2.3741	17 9 32.4	8.381	5	18 12 47.78	2.6162	21 37 13.1	2.314
6	16 14 54.18	2.3800	17 17 52.4	8.284	6	18 15 24.85	2.6193	21 39 27.4	2.162
7	16 17 17.16	2.3859	17 26 6.5	8.186	7	18 18 2.10	2.6224	21 41 32.6	2.009
8	16 19 40.49	2.3917	17 34 14.7	8.087	8	18 20 39.54	2.6255	21 43 28.5	1.855
9	16 22 4.17	2.3977	17 42 16.9	7.987	9	18 23 17.16	2.6283	21 45 15.2	1.702
10	16 24 28.21	2.4036	17 50 13.1	7.885	10	18 25 54.94	2.6310	21 46 52.7	1.547
11	16 26 52.60	2.4094	17 58 3.1	7.781	11	18 28 32.88	2.6337	21 48 20.8	1.390
12	16 29 17.34	2.4152	18 5 46.8	7.676	12	18 31 10.98	2.6362	21 49 39.5	1.234
13	16 31 42.43	2.4211	18 13 24.2	7.570	13	18 33 49.23	2.6387	21 50 48.9	1.078
14	16 34 7.87	2.4270	18 20 55.2	7.462	14	18 36 27.62	2.6409	21 51 48.8	0.920
15	16 36 33.67	2.4328	18 28 19.7	7.354	15	18 39 6.14	2.6430	21 52 39.3	0.763
16	16 38 59.81	2.4386	18 35 37.7	7.244	16	18 41 44.78	2.6450	21 53 20.4	0.606
17	16 41 26.30	2.4443	18 42 49.0	7.132	17	18 44 23.54	2.6469	21 53 52.0	0.447
18	16 43 53.13	2.4500	18 49 53.5	7.019	18	18 47 2.41	2.6487	21 54 14.0	0.287
19	16 46 20.30	2.4557	18 56 51.3	6.906	19	18 49 41.39	2.6504	21 54 26.5	-0.129
20	16 48 47.82	2.4615	19 3 42.2	6.790	20	18 52 20.46	2.6518	21 54 29.5	+0.030
21	16 51 15.68	2.4671	19 10 26.1	6.672	21	18 54 59.61	2.6532	21 54 22.9	0.190
22	16 53 43.87	2.4727	19 17 2.9	6.555	22	18 57 38.84	2.6545	21 54 6.7	0.350
23	16 56 12.40	2.4783	S. 19 23 32.7	6.436	23	19 0 18.15	2.6557	S. 21 53 40.9	0.509
SUNDAY 18.					TUESDAY 20.				
0	16 58 41.27	2.4839	S. 19 29 55.2	6.315	0	19 2 57.52	2.6566	S. 21 53 5.6	0.669
1	17 1 10.47	2.4893	19 36 10.5	6.193	1	19 5 36.94	2.6574	21 52 20.6	0.830
2	17 3 39.99	2.4947	19 42 18.4	6.069	2	19 8 16.41	2.6582	21 51 26.0	0.991
3	17 6 9.84	2.5002	19 48 18.8	5.945	3	19 10 55.92	2.6587	21 50 21.7	1.152
4	17 8 40.02	2.5057	19 54 11.8	5.820	4	19 13 35.46	2.6592	21 49 7.8	1.312
5	17 11 10.52	2.5109	19 59 57.2	5.692	5	19 16 15.03	2.6596	21 47 44.3	1.472
6	17 13 41.33	2.5161	20 5 34.9	5.564	6	19 18 54.61	2.6597	21 46 11.2	1.632
7	17 16 12.45	2.5212	20 11 4.9	5.435	7	19 21 34.20	2.6597	21 44 28.5	1.792
8	17 18 43.88	2.5264	20 16 27.1	5.304	8	19 24 13.78	2.6596	21 42 36.1	1.953
9	17 21 15.62	2.5315	20 21 41.4	5.172	9	19 26 53.35	2.6594	21 40 34.1	2.112
10	17 23 47.66	2.5365	20 26 47.8	5.039	10	19 29 32.91	2.6592	21 38 22.6	2.272
11	17 26 20.00	2.5415	20 31 46.1	4.905	11	19 32 12.45	2.6587	21 36 1.5	2.432
12	17 28 52.64	2.5464	20 36 36.4	4.770	12	19 34 51.95	2.6580	21 33 30.7	2.592
13	17 31 25.57	2.5512	20 41 18.5	4.633	13	19 37 31.41	2.6572	21 30 50.4	2.751
14	17 33 58.78	2.5558	20 45 52.4	4.497	14	19 40 10.82	2.6563	21 28 0.6	2.909
15	17 36 32.27	2.5605	20 50 18.1	4.358	15	19 42 50.17	2.6553	21 25 1.3	3.067
16	17 39 6.04	2.5651	20 54 35.4	4.217	16	19 45 29.46	2.6542	21 21 52.5	3.226
17	17 41 40.08	2.5696	20 58 44.2	4.077	17	19 48 8.68	2.6530	21 18 34.2	3.383
18	17 44 14.39	2.5739	21 2 44.6	3.936	18	19 50 47.82	2.6516	21 15 6.6	3.539
19	17 46 48.95	2.5782	21 6 36.5	3.792	19	19 53 26.87	2.6501	21 11 29.5	3.696
20	17 49 23.77	2.5825	21 10 19.7	3.648	20	19 56 5.83	2.6484	21 7 43.1	3.852
21	17 51 58.85	2.5867	21 13 54.3	3.504	21	19 58 44.68	2.6466	21 3 47.3	4.007
22	17 54 34.17	2.5907	21 17 20.2	3.359	22	20 1 23.42	2.6447	20 59 42.3	4.161
23	17 57 9.73	2.5946	21 20 37.4	3.212	23	20 4 2.05	2.6427	20 55 28.0	4.315
24	17 59 45.52	2.5984	S. 21 23 45.7	3.064	24	20 6 40.55	2.6406	S. 20 51 4.5	4.468

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 21.					FRIDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	20 6 40.55	2.6406	S. 20 51 4.5	4.468	0	22 9 8.62	2.4362	S. 14 40 36.6	10.447
1	20 9 18.92	2.6383	20 46 31.8	4.620	1	22 11 34.63	2.4308	14 30 7.1	10.535
2	20 11 57.15	2.6360	20 41 50.1	4.772	2	22 14 0.32	2.4254	14 19 32.4	10.622
3	20 14 35.24	2.6335	20 36 59.2	4.923	3	22 16 25.68	2.4200	14 8 52.5	10.707
4	20 17 13.17	2.6308	20 31 59.3	5.072	4	22 18 50.72	2.4146	13 58 7.6	10.789
5	20 19 50.94	2.6282	20 26 50.5	5.222	5	22 21 15.43	2.4091	13 47 17.8	10.870
6	20 22 28.55	2.6253	20 21 32.7	5.370	6	22 23 39.81	2.4037	13 36 23.2	10.950
7	20 25 5.98	2.6223	20 16 6.1	5.517	7	22 26 3.87	2.3982	13 25 23.8	11.028
8	20 27 43.23	2.6193	20 10 30.7	5.663	8	22 28 27.60	2.3927	13 14 19.8	11.104
9	20 30 20.30	2.6162	20 4 46.5	5.808	9	22 30 51.00	2.3873	13 3 11.3	11.179
10	20 32 57.18	2.6130	19 58 53.7	5.953	10	22 33 14.08	2.3819	12 51 58.3	11.252
11	20 35 33.86	2.6096	19 52 52.2	6.097	11	22 35 36.83	2.3764	12 40 41.1	11.322
12	20 38 10.33	2.6061	19 46 42.1	6.238	12	22 37 59.25	2.3710	12 29 19.6	11.392
13	20 40 46.59	2.6026	19 40 23.6	6.379	13	22 40 21.35	2.3657	12 17 54.0	11.460
14	20 43 22.64	2.5990	19 33 56.6	6.519	14	22 42 43.13	2.3602	12 6 24.4	11.527
15	20 45 58.47	2.5952	19 27 21.3	6.658	15	22 45 4.58	2.3548	11 54 50.8	11.592
16	20 48 34.07	2.5914	19 20 37.7	6.796	16	22 47 25.71	2.3495	11 43 13.4	11.654
17	20 51 9.44	2.5875	19 13 45.8	6.932	17	22 49 46.52	2.3442	11 31 32.3	11.715
18	20 53 44.57	2.5835	19 6 45.9	7.066	18	22 52 7.01	2.3389	11 19 47.6	11.774
19	20 56 19.46	2.5794	18 59 37.9	7.200	19	22 54 27.19	2.3337	11 7 59.4	11.832
20	20 58 54.10	2.5752	18 52 21.9	7.333	20	22 56 47.05	2.3283	10 56 7.7	11.889
21	21 1 28.49	2.5711	18 44 57.9	7.464	21	22 59 6.59	2.3231	10 44 12.7	11.944
22	21 4 2.63	2.5668	18 37 26.2	7.593	22	23 1 25.82	2.3178	10 32 14.4	11.997
23	21 6 36.50	2.5623	S. 18 29 46.7	7.722	23	23 3 44.73	2.3126	S. 10 20 13.1	12.047
THURSDAY 22.					SATURDAY 24.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	21 9 10.11	2.5579	S. 18 21 59.5	7.850	0	23 6 3.33	2.3074	S. 10 8 8.7	12.097
1	21 11 43.45	2.5534	18 14 4.7	7.975	1	23 8 21.62	2.3023	9 56 1.4	12.145
2	21 14 16.52	2.5488	18 6 2.5	8.099	2	23 10 39.61	2.2972	9 43 51.3	12.192
3	21 16 49.31	2.5441	17 57 52.8	8.222	3	23 12 57.29	2.2922	9 31 38.4	12.237
4	21 19 21.81	2.5393	17 49 35.8	8.344	4	23 15 14.67	2.2872	9 19 22.8	12.281
5	21 21 54.03	2.5347	17 41 11.5	8.465	5	23 17 31.75	2.2821	9 7 4.7	12.322
6	21 24 25.97	2.5299	17 32 40.0	8.583	6	23 19 48.52	2.2771	8 54 44.2	12.362
7	21 26 57.62	2.5250	17 24 1.5	8.699	7	23 22 5.00	2.2722	8 42 21.3	12.400
8	21 29 28.97	2.5201	17 15 16.1	8.815	8	23 24 21.19	2.2674	8 29 56.2	12.437
9	21 32 0.03	2.5151	17 6 23.7	8.930	9	23 26 37.09	2.2625	8 17 28.9	12.472
10	21 34 30.78	2.5100	16 57 24.5	9.042	10	23 28 52.69	2.2576	8 4 59.5	12.507
11	21 37 1.23	2.5050	16 48 18.7	9.152	11	23 31 8.00	2.2528	7 52 28.1	12.539
12	21 39 31.38	2.4999	16 39 6.2	9.262	12	23 33 23.03	2.2482	7 39 54.8	12.570
13	21 42 1.22	2.4947	16 29 47.3	9.369	13	23 35 37.78	2.2435	7 27 19.7	12.598
14	21 44 30.75	2.4896	16 20 21.9	9.476	14	23 37 52.25	2.2388	7 14 43.0	12.626
15	21 46 59.97	2.4843	16 10 50.2	9.580	15	23 40 6.44	2.2342	7 2 4.6	12.653
16	21 49 28.87	2.4791	16 1 12.3	9.683	16	23 42 20.35	2.2296	6 49 24.6	12.678
17	21 51 57.46	2.4738	15 51 28.2	9.784	17	23 44 33.99	2.2251	6 36 43.2	12.701
18	21 54 25.73	2.4685	15 41 38.2	9.883	18	23 46 47.36	2.2207	6 24 0.5	12.722
19	21 56 53.68	2.4632	15 31 42.2	9.982	19	23 49 0.47	2.2162	6 11 16.5	12.743
20	21 59 21.32	2.4579	15 21 40.3	10.079	20	23 51 13.31	2.2118	5 58 31.3	12.762
21	22 1 48.63	2.4525	15 11 32.7	10.173	21	23 53 25.89	2.2075	5 45 45.1	12.779
22	22 4 15.62	2.4471	15 1 19.5	10.266	22	23 55 38.21	2.2032	5 32 57.8	12.796
23	22 6 42.28	2.4417	14 51 0.8	10.357	23	23 57 50.28	2.1991	5 20 9.6	12.811
24	22 9 8.62	2.4362	S. 14 40 36.6	10.447	24	0 0 2.10	2.1949	S. 5 7 20.5	12.824

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 25.					TUESDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	0 0 2.10	2.1949	S. 5 7 20.5	12.824	0	1 41 36.05	2.0582	N. 4 59 55.9	12.057
1	0 2 13.67	2.1907	4 54 30.7	12.836	1	1 43 39.50	2.0567	5 11 58.1	12.016
2	0 4 24.99	2.1867	4 41 40.2	12.846	2	1 45 42.86	2.0553	5 23 57.8	11.974
3	0 6 36.07	2.1826	4 28 49.2	12.855	3	1 47 46.14	2.0539	5 35 55.0	11.932
4	0 8 46.90	2.1786	4 15 57.6	12.863	4	1 49 49.33	2.0525	5 47 49.7	11.889
5	0 10 57.50	2.1747	4 3 5.6	12.870	5	1 51 52.44	2.0512	5 59 41.7	11.845
6	0 13 7.87	2.1709	3 50 13.2	12.876	6	1 53 55.48	2.0500	6 11 31.1	11.801
7	0 15 18.01	2.1671	3 37 20.5	12.879	7	1 55 58.44	2.0487	6 23 17.8	11.755
8	0 17 27.92	2.1632	3 24 27.7	12.882	8	1 58 1.33	2.0476	6 35 1.7	11.708
9	0 19 37.60	2.1596	3 11 34.7	12.883	9	2 0 4.15	2.0465	6 46 42.8	11.662
10	0 21 47.07	2.1560	2 58 41.7	12.882	10	2 2 6.91	2.0455	6 58 21.1	11.613
11	0 23 56.32	2.1523	2 45 48.8	12.882	11	2 4 9.61	2.0445	7 9 56.4	11.565
12	0 26 5.35	2.1487	2 32 55.9	12.880	12	2 6 12.25	2.0436	7 21 28.9	11.517
13	0 28 14.17	2.1453	2 20 3.2	12.876	13	2 8 14.84	2.0427	7 32 58.4	11.466
14	0 30 22.79	2.1419	2 7 10.8	12.871	14	2 10 17.37	2.0417	7 44 24.8	11.414
15	0 32 31.20	2.1385	1 54 18.7	12.864	15	2 12 19.85	2.0409	7 55 48.1	11.363
16	0 34 39.41	2.1352	1 41 27.1	12.857	16	2 14 22.28	2.0402	8 7 8.4	11.312
17	0 36 47.42	2.1319	1 28 35.9	12.849	17	2 16 24.67	2.0395	8 18 25.5	11.258
18	0 38 55.24	2.1287	1 15 45.2	12.839	18	2 18 27.02	2.0388	8 29 39.4	11.204
19	0 41 2.87	2.1255	1 2 55.2	12.828	19	2 20 29.33	2.0382	8 40 50.0	11.150
20	0 43 10.30	2.1223	0 50 5.8	12.817	20	2 22 31.61	2.0377	8 51 57.4	11.095
21	0 45 17.55	2.1194	0 37 17.2	12.803	21	2 24 33.85	2.0371	9 3 1.4	11.039
22	0 47 24.63	2.1165	0 24 29.4	12.789	22	2 26 36.06	2.0366	9 14 2.1	10.983
23	0 49 31.53	2.1135	S. 0 11 42.5	12.773	23	2 28 38.24	2.0362	N. 9 24 59.4	10.926
MONDAY 26.					WEDNESDAY 28.				
0	0 51 38.25	2.1106	N. 0 1 3.4	12.757	0	2 30 40.40	2.0358	N. 9 35 53.2	10.867
1	0 53 44.80	2.1078	0 13 48.3	12.739	1	2 32 42.54	2.0354	9 46 43.5	10.809
2	0 55 51.19	2.1051	0 26 32.1	12.720	2	2 34 44.65	2.0351	9 57 30.3	10.751
3	0 57 57.41	2.1023	0 39 14.7	12.701	3	2 36 46.75	2.0348	10 8 13.6	10.691
4	1 0 3.47	2.0997	0 51 56.2	12.680	4	2 38 48.83	2.0346	10 18 53.2	10.630
5	1 2 9.37	2.0971	1 4 36.3	12.657	5	2 40 50.90	2.0344	10 29 29.2	10.569
6	1 4 15.12	2.0946	1 17 15.1	12.635	6	2 42 52.96	2.0342	10 40 1.5	10.507
7	1 6 20.72	2.0921	1 29 52.5	12.611	7	2 44 55.01	2.0342	10 50 30.1	10.445
8	1 8 26.17	2.0897	1 42 28.4	12.586	8	2 46 57.06	2.0341	11 0 54.9	10.382
9	1 10 31.48	2.0873	1 55 2.8	12.560	9	2 48 59.10	2.0340	11 11 16.0	10.319
10	1 12 36.65	2.0850	2 7 35.6	12.534	10	2 51 1.14	2.0340	11 21 33.2	10.255
11	1 14 41.68	2.0827	2 20 6.7	12.505	11	2 53 3.18	2.0341	11 31 46.6	10.190
12	1 16 46.57	2.0804	2 32 36.2	12.477	12	2 55 5.23	2.0342	11 41 56.0	10.124
13	1 18 51.33	2.0783	2 45 3.9	12.446	13	2 57 7.29	2.0343	11 52 1.5	10.059
14	1 20 55.97	2.0763	2 57 29.7	12.415	14	2 59 9.35	2.0344	12 2 3.1	9.993
15	1 23 0.49	2.0742	3 9 53.7	12.383	15	3 1 11.42	2.0346	12 12 0.7	9.926
16	1 25 4.88	2.0722	3 22 15.7	12.351	16	3 3 13.50	2.0348	12 21 54.2	9.857
17	1 27 9.15	2.0702	3 34 35.8	12.317	17	3 5 15.60	2.0352	12 31 43.6	9.790
18	1 29 13.31	2.0684	3 46 53.8	12.282	18	3 7 17.72	2.0355	12 41 29.0	9.722
19	1 31 17.36	2.0666	3 59 9.7	12.247	19	3 9 19.86	2.0358	12 51 10.2	9.652
20	1 33 21.30	2.0648	4 11 23.4	12.211	20	3 11 22.02	2.0362	13 0 47.2	9.582
21	1 35 25.14	2.0631	4 23 35.0	12.174	21	3 13 24.20	2.0365	13 10 20.1	9.512
22	1 37 28.87	2.0614	4 35 44.3	12.136	22	3 15 26.40	2.0369	13 19 48.7	9.441
23	1 39 32.51	2.0598	4 47 51.3	12.097	23	3 17 28.63	2.0374	13 29 13.0	9.369
24	1 41 36.05	2.0582	N. 4 59 55.9	12.057	24	3 19 30.89	2.0379	N. 13 38 33.0	9.297

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 29.					SATURDAY 31.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	3 19 30.89	2.0379	N. 13 38 33.0	9.297	0	4 58 19.15	2.0842	N. 19 33 3.3	5.310
1	3 21 33.18	2.0384	13 47 48.7	9.226	1	5 0 24.24	2.0854	19 38 19.1	5.217
2	3 23 35.50	2.0390	13 57 0.1	9.153	2	5 2 29.40	2.0866	19 43 29.3	5.123
3	3 25 37.86	2.0396	14 6 7.1	9.080	3	5 4 34.63	2.0877	19 48 33.9	5.029
4	3 27 40.25	2.0402	14 15 9.7	9.006	4	5 6 39.93	2.0883	19 53 32.8	4.936
5	3 29 42.68	2.0407	14 24 7.8	8.931	5	5 8 45.29	2.0899	19 58 26.2	4.842
6	3 31 45.14	2.0414	14 33 1.4	8.856	6	5 10 50.72	2.0911	20 3 13.9	4.747
7	3 33 47.65	2.0422	14 41 50.5	8.781	7	5 12 56.22	2.0923	20 7 55.9	4.653
8	3 35 50.20	2.0428	14 50 35.1	8.705	8	5 15 1.79	2.0933	20 12 32.3	4.558
9	3 37 52.79	2.0436	14 59 15.1	8.627	9	5 17 7.42	2.0944	20 17 2.9	4.462
10	3 39 55.43	2.0443	15 7 50.4	8.551	10	5 19 13.12	2.0956	20 21 27.8	4.367
11	3 41 58.11	2.0451	15 16 21.2	8.475	11	5 21 18.89	2.0967	20 25 47.0	4.272
12	3 44 0.84	2.0459	15 24 47.4	8.397	12	5 23 24.72	2.0978	20 30 0.5	4.177
13	3 46 3.62	2.0467	15 33 8.8	8.318	13	5 25 30.62	2.0988	20 34 8.2	4.080
14	3 48 6.45	2.0476	15 41 25.6	8.240	14	5 27 36.58	2.0998	20 38 10.1	3.982
15	3 50 9.33	2.0484	15 49 37.6	8.160	15	5 29 42.60	2.1008	20 42 6.1	3.886
16	3 52 12.26	2.0493	15 57 44.8	8.080	16	5 31 48.68	2.1018	20 45 56.4	3.789
17	3 54 15.25	2.0502	16 5 47.2	8.000	17	5 33 54.82	2.1029	20 49 40.8	3.692
18	3 56 18.29	2.0512	16 13 44.8	7.919	18	5 36 1.03	2.1040	20 53 19.4	3.594
19	3 58 21.39	2.0522	16 21 37.5	7.838	19	5 38 7.30	2.1049	20 56 52.1	3.496
20	4 0 24.55	2.0531	16 29 25.4	7.757	20	5 40 13.62	2.1058	21 0 18.9	3.397
21	4 2 27.76	2.0540	16 37 8.4	7.675	21	5 42 20.00	2.1068	21 3 39.8	3.299
22	4 4 31.03	2.0550	16 44 46.4	7.592	22	5 44 26.44	2.1077	21 6 54.8	3.201
23	4 6 34.36	2.0561	N. 16 52 19.4	7.509	23	5 46 32.93	2.1087	N. 21 10 3.9	3.102
FRIDAY 30.					SUNDAY, SEPTEMBER 1.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	4 8 37.76	2.0572	N. 16 59 47.5	7.427	0	5 48 39.48	2.1096	N. 21 13 7.0	3.002
1	4 10 41.22	2.0582	17 7 10.6	7.343	PHASES OF THE MOON.				
2	4 12 44.74	2.0592	17 14 28.6	7.258					
3	4 14 48.32	2.0602	17 21 41.6	7.174					
4	4 16 51.97	2.0613	17 28 49.5	7.089					
5	4 18 55.68	2.0624	17 35 52.3	7.004	● New Moon . . . . . Aug. 8 18 36.4 ☾ First Quarter . . . . . 16 9 5.5 ○ Full Moon . . . . . 23 0 15.1 ☾ Last Quarter . . . . . 30 5 27.9				
6	4 20 59.46	2.0635	17 42 50.0	6.918					
7	4 23 3.30	2.0646	17 49 42.5	6.832					
8	4 25 7.21	2.0657	17 56 29.8	6.745					
9	4 27 11.19	2.0669	18 3 11.9	6.658	d h m ☾ Apogee . . . . . Aug. 5 16.6 ☾ Perigee . . . . . 21 6.8				
10	4 29 15.24	2.0680	18 9 48.8	6.571					
11	4 31 19.35	2.0691	18 16 20.4	6.482					
12	4 33 23.53	2.0702	18 22 46.7	6.395					
13	4 35 27.78	2.0714	18 29 7.8	6.307					
14	4 37 32.10	2.0726	18 35 23.5	6.217					
15	4 39 36.49	2.0737	18 41 33.9	6.128					
16	4 41 40.95	2.0749	18 47 38.9	6.038					
17	4 43 45.48	2.0761	18 53 38.5	5.948					
18	4 45 50.08	2.0772	18 59 32.7	5.858					
19	4 47 54.75	2.0784	19 5 21.5	5.768					
20	4 49 59.49	2.0796	19 11 4.9	5.677					
21	4 52 4.30	2.0807	19 16 42.7	5.585					
22	4 54 9.18	2.0819	19 22 15.1	5.493					
23	4 56 14.13	2.0831	19 27 41.9	5.402					
24	4 58 19.15	2.0842	N. 19 33 3.3	5.310					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	<i>α</i> Aquilæ	W.	103 4 30	3533	104 24 18	3555	105 43 42	3577	107 2 42	3600
	Fomalhaut	W.	69 40 38	3112	71 8 33	3120	72 36 18	3128	74 3 53	3136
	<i>α</i> Pegasi	W.	55 19 8	3465	56 40 11	3457	58 1 23	3451	59 22 42	3445
	SATURN	W.	45 37 19	2867	47 10 20	2879	48 43 6	2891	50 15 37	2902
	SUN	E.	85 24 27	3221	83 58 43	3234	82 33 15	3247	81 8 2	3260
2	Fomalhaut	W.	81 19 21	3178	82 45 57	3186	84 12 23	3193	85 38 41	3200
	<i>α</i> Pegasi	W.	66 10 33	3431	67 32 15	3430	68 53 58	3430	70 15 41	3430
	SATURN	W.	57 54 42	2954	59 25 53	2963	60 56 52	2971	62 27 41	2979
	SUN	E.	74 5 37	3319	72 41 48	3329	71 18 10	3338	69 54 43	3348
3	Fomalhaut	W.	92 47 56	3237	94 13 22	3244	95 38 39	3251	97 3 48	3257
	<i>α</i> Pegasi	W.	77 4 8	3435	78 25 45	3436	79 47 21	3438	81 8 55	3440
	SATURN	W.	69 59 21	3015	71 29 15	3021	72 59 2	3026	74 28 43	3031
	<i>α</i> Arietis	W.	33 31 40	3551	34 51 8	3519	36 11 11	3491	37 31 45	3466
	SUN	E.	63 0 1	3388	61 37 31	3395	60 15 9	3401	58 52 54	3407
4	Fomalhaut	W.	104 7 40	3289	105 32 4	3295	106 56 21	3302	108 20 30	3308
	<i>α</i> Pegasi	W.	87 56 7	3452	89 17 25	3454	90 38 40	3457	91 59 52	3460
	SATURN	W.	81 55 39	3051	83 24 49	3054	84 53 55	3056	86 22 58	3058
	<i>α</i> Arietis	W.	44 20 34	3379	45 43 15	3366	47 6 10	3355	48 29 18	3344
	SUN	E.	52 3 7	3430	50 41 24	3434	49 19 46	3437	47 58 11	3439
5	<i>α</i> Pegasi	W.	98 44 58	3477	100 5 48	3482	101 26 32	3486	102 47 12	3490
	SATURN	W.	93 47 40	3065	95 16 32	3065	96 45 25	3065	98 14 18	3065
	<i>α</i> Arietis	W.	55 27 47	3301	56 51 57	3294	58 16 15	3287	59 40 41	3280
	SUN	E.	41 10 54	3447	39 49 31	3448	38 28 10	3448	37 6 48	3449
11	SUN	W.	25 19 17	3227	26 44 54	3217	28 10 43	3208	29 36 43	3198
	Antares	E.	86 7 45	2910	84 35 39	2902	83 3 23	2894	81 30 57	2887
	MARS	E.	114 34 25	2913	113 2 23	2905	111 30 11	2898	109 57 49	2889
12	SUN	W.	36 49 34	3151	38 16 42	3140	39 44 3	3130	41 11 36	3120
	Antares	E.	73 46 20	2848	72 12 55	2841	70 39 20	2833	69 5 35	2825
	MARS	E.	102 13 19	2848	100 39 53	2839	99 6 16	2830	97 32 28	2821
13	SUN	W.	48 32 23	3069	50 1 10	3058	51 30 11	3047	52 59 25	3037
	Antares	E.	61 14 16	2785	59 39 29	2778	58 4 32	2770	56 29 25	2763
	MARS	E.	89 40 34	2777	88 5 36	2768	86 30 26	2758	84 55 3	2749
	<i>α</i> Aquilæ	E.	106 52 1	3406	105 29 51	3385	104 7 17	3365	102 44 21	3347
14	SUN	W.	60 29 2	2979	61 59 41	2968	63 30 34	2956	65 1 42	2943
	Antares	E.	48 31 22	2726	46 55 17	2720	45 19 4	2714	43 42 43	2708
	MARS	E.	76 54 59	2700	75 18 19	2690	73 41 26	2680	72 4 19	2669
	<i>α</i> Aquilæ	E.	95 44 42	3267	94 19 52	3254	92 54 47	3242	91 29 27	3229
15	SUN	W.	72 41 19	2880	74 14 3	2867	75 47 3	2854	77 20 21	2841
	MARS	E.	63 55 14	2618	62 16 43	2607	60 37 57	2596	58 58 57	2586
	<i>α</i> Aquilæ	E.	84 19 27	3180	82 52 54	3172	81 26 11	3165	79 59 20	3160
16	SUN	W.	85 11 5	2774	86 46 6	2760	88 21 26	2747	89 57 4	2733
	Spica	W.	25 57 56	2630	27 36 9	2600	29 15 4	2572	30 54 38	2545

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
1	$\alpha$ Aquilæ W.	108 21 16	3624	109 39 24	3649	110 57 6	3674	112 14 21	3700
	Fomalhaut W.	75 31 19	3145	76 58 34	3153	78 25 39	3161	79 52 35	3169
	$\alpha$ Pegasi W.	60 44 8	3440	62 5 39	3437	63 27 14	3434	64 48 52	3432
	SATURN W.	51 47 53	2913	53 19 55	2924	54 51 43	2934	56 23 19	2944
	SUN E.	79 43 5	3273	78 18 22	3285	76 53 54	3297	75 29 39	3308
2	Fomalhaut W.	87 4 50	3208	88 30 49	3215	89 56 40	3223	91 22 22	3230
	$\alpha$ Pegasi W.	71 37 24	3431	72 59 6	3431	74 20 48	3432	75 42 29	3433
	SATURN W.	63 58 20	2987	65 28 49	2994	66 59 8	3001	68 29 19	3009
	SUN E.	68 31 27	3357	67 8 21	3365	65 45 25	3374	64 22 39	3381
3	Fomalhaut W.	98 28 50	3264	99 53 44	3270	101 18 30	3276	102 43 9	3283
	$\alpha$ Pegasi W.	82 30 27	3442	83 51 56	3444	85 13 22	3446	86 34 46	3449
	SATURN W.	75 58 17	3036	77 27 45	3040	78 57 8	3044	80 26 26	3048
	$\alpha$ Arietis W.	38 52 47	3445	40 14 13	3425	41 36 1	3408	42 58 9	3393
	SUN E.	57 30 45	3412	56 8 43	3417	54 46 46	3422	53 24 54	3426
4	Fomalhaut W.	109 44 32	3315	111 8 26	3321	112 32 13	3327	113 55 53	3334
	$\alpha$ Pegasi W.	93 21 0	3463	94 42 5	3467	96 3 6	3470	97 24 4	3473
	SATURN W.	87 51 58	3060	89 20 56	3062	90 49 52	3063	92 18 47	3065
	$\alpha$ Arietis W.	49 52 39	3334	51 16 11	3325	52 39 53	3317	54 3 45	3309
	SUN E.	46 36 39	3442	45 15 10	3444	43 53 43	3445	42 32 18	3446
5	$\alpha$ Pegasi W.	104 7 48	3495	105 28 18	3500	106 48 42	3506	108 9 0	3511
	SATURN W.	99 43 11	3064	101 12 5	3063	102 41 0	3062	104 9 56	3060
	$\alpha$ Arietis W.	61 5 16	3274	62 29 58	3269	63 54 46	3263	65 19 41	3256
	SUN E.	35 45 27	3449	34 24 6	3448	33 2 44	3448	31 41 22	3447
11	SUN W.	31 2 55	3188	32 29 18	3179	33 55 52	3170	35 22 38	3161
	Antares E.	79 58 21	2880	78 25 36	2872	76 52 41	2864	75 19 36	2856
	MARS E.	108 25 16	2881	106 52 33	2873	105 19 39	2864	103 46 34	2856
12	SUN W.	42 39 21	3110	44 7 18	3100	45 35 27	3090	47 3 49	3080
	Antares E.	67 31 40	2817	65 57 35	2809	64 23 19	2801	62 48 53	2793
	MARS E.	95 58 28	2813	94 24 17	2804	92 49 55	2795	91 15 21	2786
13	SUN W.	54 28 52	3086	55 58 33	3014	57 28 28	3002	58 58 38	2991
	Antares E.	54 54 8	2755	53 18 41	2747	51 43 4	2740	50 7 18	2733
	MARS E.	83 19 28	2739	81 43 40	2729	80 7 40	2719	78 31 26	2710
	$\alpha$ Aquilæ E.	101 21 4	3330	99 57 27	3313	98 33 30	3297	97 9 15	3282
14	SUN W.	66 33 6	2931	68 4 45	2919	69 36 40	2906	71 8 51	2893
	Antares E.	42 6 14	2704	40 29 38	2700	38 52 58	2696	37 16 13	2693
	MARS E.	70 26 58	2659	68 49 23	2649	67 11 34	2638	65 33 31	2628
	$\alpha$ Aquilæ E.	90 3 52	3218	88 38 4	3207	87 12 3	3197	85 45 50	3188
15	SUN W.	78 53 55	2828	80 27 46	2815	82 1 55	2801	83 36 21	2788
	MARS E.	57 19 43	2575	55 40 14	2565	54 0 31	2555	52 20 34	2544
	$\alpha$ Aquilæ E.	78 32 23	3155	77 5 20	3152	75 38 13	3150	74 11 4	3148
16	SUN W.	91 33 0	2719	93 9 14	2705	94 45 47	2692	96 22 38	2678
	Spica W.	32 34 49	2520	34 15 34	2497	35 56 52	2475	37 38 40	2455

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
16	MARS E.	50 40 22	2534	48 59 56	2525	47 19 18	2515	45 38 26	2506
	α Aquilæ E.	72 43 53	3148	71 16 41	3150	69 49 31	3153	68 22 26	3158
	Fomalhaut E.	105 37 55	2680	104 0 48	2664	102 23 20	2649	100 45 31	2634
17	SUN W.	97 59 47	2664	99 37 15	2651	101 15 1	2638	102 53 5	2624
	Spica W.	39 20 56	2436	41 3 40	2417	42 46 50	2399	44 30 26	2382
	α Aquilæ E.	61 9 11	3212	59 43 16	3231	58 17 43	3253	56 52 36	3278
	Fomalhaut E.	92 31 24	2563	90 51 37	2550	89 11 33	2537	87 31 11	2525
	α Pegasi E.	108 2 40	2781	106 27 47	2760	104 52 26	2740	103 16 39	2722
	SATURN E.	114 55 51	2337	113 10 45	2324	111 25 20	2311	109 39 36	2298
18	SUN W.	111 7 57	2559	112 47 49	2547	114 27 57	2534	116 8 23	2522
	Spica W.	53 14 20	2304	55 0 13	2290	56 46 27	2277	58 33 1	2264
	Fomalhaut E.	79 5 22	2472	77 23 30	2463	75 41 25	2455	73 59 9	2449
	α Pegasi E.	95 11 58	2642	93 34 0	2628	91 55 43	2615	90 17 9	2604
	SATURN E.	100 46 22	2236	98 58 48	2225	97 10 58	2213	95 22 50	2201
19	Spica W.	67 30 31	2204	69 18 53	2193	71 7 31	2183	72 56 24	2174
	Fomalhaut E.	65 25 42	2427	63 42 45	2425	61 59 45	2425	60 16 46	2427
	α Pegasi E.	82 0 53	2561	80 21 5	2556	78 41 10	2553	77 1 10	2550
	SATURN E.	86 17 59	2149	84 28 14	2139	82 38 15	2130	80 48 2	2121
20	Spica W.	82 4 9	2134	83 54 17	2128	85 44 34	2122	87 35 0	2117
	Antares W.	36 28 7	2222	38 16 2	2206	40 4 21	2192	41 53 1	2180
	Fomalhaut E.	51 43 16	2463	50 1 11	2477	48 19 26	2494	46 38 5	2515
	α Pegasi E.	68 40 50	2558	67 0 57	2565	65 21 14	2574	63 41 43	2584
	SATURN E.	71 33 48	2084	69 42 24	2078	67 50 51	2073	65 59 10	2068
	α Arietis E.	111 17 52	2272	109 31 11	2262	107 44 15	2253	105 57 5	2244
21	Spica W.	96 48 47	2101	98 39 45	2100	100 30 44	2099	102 21 44	2100
	Antares W.	51 0 16	2138	52 50 17	2133	54 40 25	2129	56 30 40	2126
	α Pegasi E.	55 28 55	2678	53 51 45	2707	52 15 14	2739	50 39 26	2775
	SATURN E.	56 39 8	2052	54 46 55	2051	52 54 40	2050	51 2 24	2051
	α Arietis E.	96 58 45	2218	95 10 45	2216	93 22 41	2214	91 34 35	2214
22	Antares W.	65 42 35	2125	67 32 56	2127	69 23 14	2130	71 13 27	2134
	MARS W.	36 6 2	2200	37 54 29	2200	39 42 57	2199	41 31 26	2200
	SATURN E.	41 41 28	2062	39 49 29	2066	37 57 37	2071	36 5 53	2077
	α Arietis E.	82 34 24	2226	80 46 36	2231	78 58 55	2238	77 11 24	2245
	Aldebaran E.	113 54 59	2075	112 3 22	2078	110 11 49	2082	108 20 22	2087
23	Antares W.	80 22 39	2165	82 11 59	2174	84 1 6	2183	85 50 0	2193
	MARS W.	50 32 59	2221	52 20 55	2228	54 8 41	2236	55 56 15	2245
	α Aquilæ W.	42 23 32	3770	43 39 5	3670	44 56 24	3581	46 15 19	3505
	α Arietis E.	68 17 2	2298	66 31 0	2311	64 45 17	2326	62 59 56	2343
	Aldebaran E.	99 5 25	2122	97 14 59	2131	95 24 47	2141	93 34 49	2151
24	Antares W.	94 50 28	2251	96 37 40	2264	98 24 32	2278	100 11 3	2293
	MARS W.	64 50 30	2300	66 36 30	2312	68 22 12	2325	70 7 35	2339
	α Aquilæ W.	53 8 4	3245	54 33 20	3213	55 59 14	3184	57 25 42	3161
	α Arietis E.	54 19 42	2444	52 37 10	2469	50 55 13	2495	49 13 53	2524
	Aldebaran E.	84 29 4	2209	82 40 49	2222	80 52 54	2235	79 5 19	2249



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
16	MARS E.	43 57 21	2497	42 16 4	2489	40 34 35	2481	38 52 55	2473
	α Aquilæ E.	66 55 27	3165	65 28 35	3173	64 1 53	3184	62 35 24	3197
	Fomalhaut E.	99 7 22	2619	97 28 52	2604	95 50 2	2590	94 10 52	2576
17	SUN W.	104 31 28	2611	106 10 9	2598	107 49 7	2585	109 28 23	2572
	Spica W.	46 14 27	2366	47 58 51	2350	49 43 38	2334	51 28 48	2319
	α Aquilæ E.	55 27 59	3308	54 3 57	3343	52 40 35	3382	51 17 58	3423
	Fomalhaut E.	85 50 32	2513	84 9 37	2502	82 28 26	2492	80 47 1	2482
	α Pegasi E.	101 40 28	2704	100 3 53	2687	98 26 56	2671	96 49 37	2656
	SATURN E.	107 53 34	2286	106 7 14	2273	104 20 35	2261	102 33 38	2248
18	SUN W.	117 49 5	2511	119 30 3	2499	121 11 17	2488	122 52 47	2478
	Spica W.	60 19 54	2251	62 7 6	2238	63 54 37	2226	65 42 25	2214
	Fomalhaut E.	72 16 44	2442	70 34 9	2436	68 51 25	2432	67 8 35	2429
	α Pegasi E.	88 38 20	2594	86 59 17	2585	85 20 0	2576	83 40 32	2568
	SATURN E.	93 34 24	2190	91 45 41	2180	89 56 43	2169	88 7 29	2159
19	Spica W.	74 45 31	2165	76 34 52	2156	78 24 26	2148	80 14 12	2141
	Fomalhaut E.	58 33 49	2430	56 50 57	2436	55 8 12	2443	53 25 37	2452
	α Pegasi E.	75 21 6	2548	73 40 59	2548	72 0 53	2550	70 20 49	2553
	SATURN E.	78 57 35	2113	77 6 55	2105	75 16 4	2098	73 25 2	2091
20	Spica W.	89 25 33	2113	91 16 13	2109	93 7 0	2106	94 57 52	2103
	Antares W.	43 41 59	2169	45 31 14	2159	47 20 43	2151	49 10 24	2144
	Fomalhaut E.	44 57 13	2540	43 16 56	2569	41 37 19	2604	39 58 29	2645
	α Pegasi E.	62 2 26	2597	60 23 27	2613	58 44 50	2632	57 6 38	2653
	SATURN E.	64 7 21	2064	62 15 25	2060	60 23 24	2057	58 31 18	2054
	α Arietis E.	104 9 43	2237	102 22 11	2231	100 34 30	2226	98 46 41	2221
21	Spica W.	104 12 43	2101	106 3 41	2103	107 54 36	2105	109 45 27	2108
	Antares W.	58 21 0	2124	60 11 23	2123	62 1 47	2123	63 52 12	2124
	α Pegasi E.	49 4 26	2618	47 30 21	2666	45 57 18	2692	44 25 24	2681
	SATURN E.	49 10 9	2052	47 17 54	2053	45 25 42	2055	43 33 33	2058
	α Arietis E.	89 46 29	2215	87 58 24	2216	86 10 20	2218	84 22 19	2222
22	Antares W.	73 3 34	2139	74 53 34	2145	76 43 25	2151	78 33 7	2157
	MARS W.	43 19 54	2202	45 8 19	2205	46 56 39	2209	48 44 53	2214
	SATURN E.	34 14 17	2083	32 22 51	2091	30 31 38	2099	28 40 37	2107
	α Arietis E.	75 24 4	2254	73 36 56	2263	71 50 2	2273	70 3 23	2285
	Aldebaran E.	106 29 3	2093	104 37 53	2099	102 46 53	2106	100 56 3	2114
23	Antares W.	87 38 39	2203	89 27 2	2214	91 15 8	2226	93 2 57	2238
	MARS W.	57 43 37	2254	59 30 44	2264	61 17 36	2275	63 4 12	2287
	α Aquilæ W.	47 35 38	3438	48 57 12	3379	50 19 53	3327	51 43 33	3283
	α Arietis E.	61 14 59	2360	59 30 27	2379	57 46 22	2400	56 2 47	2421
	Aldebaran E.	91 45 7	2161	89 55 40	2172	88 6 30	2184	86 17 38	2196
24	Antares W.	101 57 13	2308	103 43 1	2324	105 28 26	2340	107 13 28	2356
	MARS W.	71 52 38	2354	73 37 19	2369	75 21 39	2384	77 5 37	2400
	α Aquilæ W.	58 52 38	3141	60 19 58	3126	61 47 36	3113	63 15 29	3103
	α Arietis E.	47 33 13	2555	45 53 16	2588	44 14 5	2624	42 35 42	2662
	Aldebaran E.	77 18 5	2264	75 31 13	2279	73 44 42	2294	71 58 33	2309

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
25	MARS	W.	78 49 12	2416	80 32 24	2432	82 15 13	2449	83 57 38	2466
	$\alpha$ Aquilæ	W.	64 43 35	3096	66 11 49	3092	67 40 8	3090	69 8 30	3090
	Aldebaran	E.	70 12 47	2326	68 27 25	2342	66 42 26	2358	64 57 51	2375
	Pollux	E.	114 18 27	2359	112 33 53	2374	110 49 41	2390	109 5 52	2406
26	MARS	W.	92 23 34	2556	94 3 30	2574	95 43 0	2592	97 22 6	2611
	$\alpha$ Aquilæ	W.	76 29 38	3115	77 57 29	3124	79 25 9	3135	80 52 36	3147
	Fomalhaut	W.	41 20 46	2962	42 51 46	2949	44 23 4	2939	45 54 34	2932
	SATURN	W.	16 21 41	2474	18 3 31	2486	19 45 4	2499	21 26 18	2513
	Aldebaran	E.	56 21 5	2462	54 38 58	2480	52 57 17	2498	51 16 0	2516
	Pollux	E.	100 32 33	2489	98 51 5	2507	97 10 1	2524	95 29 21	2542
	JUPITER	E.	109 38 40	2525	107 58 1	2543	106 17 47	2561	104 37 58	2579
27	MARS	W.	105 31 13	2705	107 7 46	2723	108 43 55	2742	110 19 39	2760
	$\alpha$ Aquilæ	W.	88 5 55	3220	89 31 40	3238	90 57 4	3256	92 22 7	3275
	Fomalhaut	W.	53 33 13	2931	55 4 53	2935	56 36 28	2940	58 7 56	2947
	$\alpha$ Pegasi	W.	40 51 21	3611	42 9 43	3566	43 28 54	3528	44 48 47	3496
	SATURN	W.	29 47 23	2591	31 26 30	2607	33 5 15	2624	34 43 38	2640
	Aldebaran	E.	42 55 53	2606	41 17 6	2624	39 38 43	2642	38 0 45	2659
	Pollux	E.	87 12 11	2631	85 33 58	2648	83 56 8	2666	82 18 42	2684
	JUPITER	E.	96 25 3	2669	94 47 41	2687	93 10 43	2704	91 34 9	2722
	SUN	E.	127 30 16	2941	125 58 49	2959	124 27 45	2978	122 57 5	2997
28	$\alpha$ Aquilæ	W.	99 21 37	3380	100 44 16	3403	102 6 30	3426	103 28 17	3450
	Fomalhaut	W.	65 42 48	2991	67 13 12	3001	68 43 23	3012	70 13 21	3023
	$\alpha$ Pegasi	W.	51 35 38	3394	52 58 1	3384	54 20 36	3375	55 43 22	3368
	SATURN	W.	42 50 3	2720	44 26 16	2736	46 2 8	2751	47 37 40	2766
	Aldebaran	E.	29 56 46	2747	28 21 8	2764	26 45 52	2781	25 10 59	2798
	Pollux	E.	74 17 22	2769	72 42 14	2786	71 7 28	2802	69 33 3	2818
	JUPITER	E.	83 37 2	2807	82 2 43	2823	80 28 45	2839	78 55 8	2855
	SUN	E.	115 29 27	3087	114 1 1	3104	112 32 57	3121	111 5 13	3138
29	Fomalhaut	W.	77 39 49	3078	79 8 25	3089	80 36 48	3101	82 4 57	3112
	$\alpha$ Pegasi	W.	62 38 32	3355	64 1 40	3355	65 24 48	3356	66 47 55	3358
	SATURN	W.	55 30 30	2837	57 4 10	2851	58 37 32	2864	60 10 37	2876
	Pollux	E.	61 46 8	2896	60 13 44	2911	58 41 39	2925	57 9 52	2939
	JUPITER	E.	71 11 58	2929	69 40 16	2942	68 8 51	2956	66 37 43	2969
	SUN	E.	103 51 27	3216	102 25 37	3231	101 0 5	3245	99 34 49	3259
30	Fomalhaut	W.	89 22 23	3166	90 49 13	3176	92 15 51	3186	93 42 16	3196
	$\alpha$ Pegasi	W.	73 42 40	3376	75 5 24	3380	76 28 4	3384	77 50 39	3388
	SATURN	W.	67 52 15	2932	69 23 52	2942	70 55 17	2952	72 26 30	2961
	Pollux	E.	49 35 20	3006	48 5 15	3019	46 35 27	3032	45 5 54	3044
	JUPITER	E.	59 5 54	3027	57 36 15	3037	56 6 48	3047	54 37 34	3056
	SUN	E.	92 32 26	3322	91 8 41	3333	89 45 8	3344	88 21 48	3354
31	Fomalhaut	W.	100 51 30	3444	102 16 47	3453	103 41 53	3462	105 6 49	3471
	$\alpha$ Pegasi	W.	84 42 11	3414	86 4 12	3419	87 26 7	3424	88 47 56	3429
	SATURN	W.	79 59 51	3001	81 30 3	3007	83 0 7	3013	84 30 3	3018
	Pollux	E.	37 41 58	3106	36 13 56	3119	34 46 10	3133	33 18 40	3146
	JUPITER	E.	47 14 7	3097	45 45 54	3104	44 17 49	3110	42 49 52	3116
	SUN	E.	81 27 50	3398	80 5 32	3406	78 43 22	3413	77 21 20	3419

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
25	MARS W.	85 39 39	2484	87 21 15	2502	89 2 26	2519	90 43 13	2538
	α Aquilæ W.	70 36 52	3092	72 5 12	3096	73 33 27	3102	75 1 36	3108
	Aldebaran E.	63 13 41	2392	61 29 55	2409	59 46 34	2426	58 3 37	2444
	Pollux E.	107 22 25	2422	105 39 22	2438	103 56 42	2455	102 14 26	2472
26	MARS W.	99 0 46	2690	100 39 1	2649	102 16 50	2668	103 54 14	2686
	α Aquilæ W.	82 19 49	3160	83 46 46	3173	85 13 27	3188	86 39 50	3204
	Fomalhaut W.	47 26 12	2928	48 57 56	2926	50 29 42	2926	52 1 28	2928
	SATURN W.	23 7 13	2328	24 47 48	2343	26 28 1	2359	28 7 53	2374
	Aldebaran E.	49 35 9	2534	47 54 43	2552	46 14 42	2570	44 35 5	2588
	Pollux E.	93 49 6	2560	92 9 16	2577	90 29 50	2595	88 50 48	2613
	JUPITER E.	102 58 34	2597	101 19 35	2615	99 41 0	2633	98 2 49	2651
27	MARS W.	111 54 59	2779	113 29 54	2797	115 4 26	2815	116 38 34	2833
	α Aquilæ W.	93 46 48	3294	95 11 6	3314	96 35 1	3335	97 58 32	3358
	Fomalhaut W.	59 39 15	2955	61 10 24	2963	62 41 23	2972	64 12 11	2981
	α Pegasi W.	46 9 16	3468	47 30 16	3445	48 51 42	3425	50 13 31	3408
	SATURN W.	36 21 39	2657	37 59 17	2672	39 36 34	2688	41 13 29	2704
	Aldebaran E.	36 23 10	2677	34 45 59	2695	33 9 12	2712	31 32 48	2729
	Pollux E.	80 41 40	2701	79 5 1	2718	77 28 46	2735	75 52 53	2752
	JUPITER E.	89 57 58	2739	88 22 10	2756	86 46 46	2773	85 11 43	2790
	SUN E.	121 26 49	3015	119 56 55	3034	118 27 24	3052	116 58 15	3069
28	α Aquilæ W.	104 49 37	3476	106 10 28	3501	107 30 51	3527	108 50 45	3555
	Fomalhaut W.	71 43 6	3034	73 12 37	3045	74 41 54	3056	76 10 58	3067
	α Pegasi W.	57 6 15	3363	58 29 14	3360	59 52 18	3357	61 15 24	3355
	SATURN W.	49 12 52	2781	50 47 44	2795	52 22 18	2810	53 56 33	2824
	Aldebaran E.	23 36 29	2815	22 2 21	2832	20 28 35	2849	18 55 11	2866
	Pollux E.	67 58 59	2835	66 25 16	2851	64 51 54	2866	63 18 51	2881
	JUPITER E.	77 21 51	2870	75 48 54	2885	74 16 17	2900	72 43 58	2915
	SUN E.	109 37 49	3154	108 10 45	3170	106 44 0	3186	105 17 34	3201
29	Fomalhaut W.	83 32 53	3123	85 0 35	3133	86 28 4	3144	87 55 20	3155
	α Pegasi W.	68 10 59	3361	69 34 0	3364	70 56 57	3368	72 19 51	3372
	SATURN W.	61 43 27	2888	63 16 1	2900	64 48 20	2911	66 20 24	2922
	Pollux E.	55 38 23	2953	54 7 12	2967	52 36 18	2980	51 5 41	2993
	JUPITER E.	65 6 51	2981	63 36 15	2993	62 5 54	3005	60 35 47	3016
	SUN E.	98 9 50	3273	96 45 7	3286	95 20 39	3298	93 56 25	3311
30	Fomalhaut W.	95 8 30	3206	96 34 32	3216	98 0 22	3225	99 26 2	3235
	α Pegasi W.	79 13 9	3393	80 35 33	3399	81 57 51	3405	83 20 4	3408
	SATURN W.	73 57 31	2970	75 28 21	2978	76 59 1	2986	78 29 31	2994
	Pollux E.	43 36 37	3056	42 7 34	3069	40 38 47	3082	39 10 15	3094
	JUPITER E.	53 8 32	3066	51 39 41	3074	50 11 0	3082	48 42 29	3090
	SUN E.	86 58 39	3364	85 35 42	3373	84 12 55	3382	82 50 18	3390
31	Fomalhaut W.	106 31 34	3280	107 56 9	3289	109 20 33	3297	110 44 48	3305
	α Pegasi W.	90 9 40	3435	91 31 17	3440	92 52 49	3445	94 14 14	3450
	SATURN W.	85 59 53	3024	87 29 36	3029	88 59 13	3033	90 28 45	3036
	Pollux E.	31 51 26	3161	30 24 29	3177	28 57 52	3193	27 31 34	3209
	JUPITER E.	41 22 2	3121	39 54 18	3126	38 26 40	3130	36 59 7	3134
	SUN E.	75 59 25	3425	74 37 36	3430	73 15 54	3435	71 54 17	3439

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.		Subtracted from Apparent Time.	
		h m s	s	° ' "	"	' "	s	m s	s
SUN.	1	10 38 13.30	9.083	N. 8 36 57.1	- 54.13	15 52.86	64.41	0 13.36	0.771
Mon.	2	10 41 51.14	9.070	8 15 13.9	54.47	15 53.08	64.37	0 5.29	0.783
Tues.	3	10 45 28.70	9.059	7 53 22.6	54.81	15 53.31	64.33	0 24.23	0.795
Wed.	4	10 49 5.98	9.048	7 31 23.7	- 55.11	15 53.54	64.29	0 43.44	0.806
Thur.	5	10 52 43.02	9.038	7 9 17.3	55.41	15 53.77	64.25	1 2.91	0.816
Frid.	6	10 56 19.81	9.027	6 47 3.9	55.70	15 54.01	64.21	1 22.62	0.826
Sat.	7	10 59 56.39	9.018	6 24 43.8	- 55.97	15 54.25	64.18	1 42.54	0.834
SUN.	8	11 3 32.76	9.011	6 2 17.2	56.23	15 54.49	64.15	2 2.67	0.842
Mon.	9	11 7 8.93	9.004	5 39 44.7	56.47	15 54.74	64.12	2 22.99	0.850
Tues.	10	11 10 44.93	8.996	5 17 6.4	- 56.70	15 54.99	64.10	2 43.49	0.857
Wed.	11	11 14 20.77	8.989	4 54 22.9	56.91	15 55.24	64.08	3 4.14	0.864
Thur.	12	11 17 56.46	8.983	4 31 34.3	57.11	15 55.50	64.06	3 24.96	0.870
Frid.	13	11 21 32.02	8.978	4 8 41.2	- 57.29	15 55.76	64.05	3 45.89	0.875
Sat.	14	11 25 7.47	8.974	3 45 43.7	57.47	15 56.02	64.04	4 6.94	0.879
SUN.	15	11 28 42.82	8.972	3 22 42.3	57.64	15 56.28	64.03	4 28.08	0.882
Mon.	16	11 32 18.10	8.970	2 59 37.2	- 57.78	15 56.54	64.02	4 49.30	0.885
Tues.	17	11 35 53.33	8.968	2 36 28.9	57.91	15 56.81	64.01	5 10.56	0.887
Wed.	18	11 39 28.53	8.967	2 13 17.6	58.02	15 57.07	64.01	5 31.86	0.888
Thur.	19	11 43 3.71	8.966	1 50 3.7	- 58.12	15 57.34	64.01	5 53.17	0.887
Frid.	20	11 46 38.92	8.968	1 26 47.6	58.22	15 57.61	64.02	6 14.46	0.886
Sat.	21	11 50 14.16	8.970	1 3 29.4	58.30	15 57.88	64.03	6 35.71	0.884
SUN.	22	11 53 49.46	8.973	0 40 9.6	- 58.36	15 58.14	64.04	6 56.90	0.881
Mon.	23	11 57 24.85	8.977	N. 0 16 48.4	58.41	15 58.41	64.05	7 18.00	0.877
Tues.	24	12 1 0.37	8.983	S. 0 6 33.9	58.45	15 58.68	64.07	7 38.98	0.871
Wed.	25	12 4 36.03	8.989	0 29 56.8	- 58.47	15 58.95	64.09	7 59.82	0.865
Thur.	26	12 8 11.84	8.996	0 53 20.3	58.48	15 59.21	64.11	8 20.51	0.858
Frid.	27	12 11 47.82	9.004	1 16 43.7	58.48	15 59.48	64.14	8 41.03	0.850
Sat.	28	12 15 24.02	9.013	1 40 7.0	- 58.46	15 59.75	64.17	9 1.32	0.841
SUN.	29	12 19 0.45	9.023	2 3 29.6	58.43	16 0.02	64.20	9 21.39	0.831
Mon.	30	12 22 37.12	9.034	2 26 51.3	58.38	16 0.29	64.23	9 41.22	0.821
Tues.	31	12 26 14.06	9.045	S. 2 50 11.7	- 58.32	16 0.56	64.27	10 0.78	0.809

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.18 from the sidereal time. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from		Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Added to Mean Time.			
		h m s	s	° ' "	"	m s	s	h m s	
SUN.	1	10 38 13.27	9.085	N. 8 36 57.3	-54.14	0 13.37	0.771	10 37 59.90	
Mon.	2	10 41 51.16	9.072	8 15 13.8	54.48	0 5.29	0.783	10 41 56.45	
Tues.	3	10 45 28.76	9.061	7 53 22.2	54.82	0 24.24	0.795	10 45 53.00	
Wed.	4	10 49 6.09	9.050	7 31 23.0	-55.12	0 43.47	0.806	10 49 49.56	
Thur.	5	10 52 43.18	9.039	7 9 16.3	55.42	1 2.93	0.816	10 53 46.11	
Frid.	6	10 56 20.02	9.029	6 47 2.6	55.71	1 22.64	0.826	10 57 42.66	
Sat.	7	10 59 56.65	9.020	6 24 42.2	-55.98	1 42.57	0.834	11 1 39.22	
SUN.	8	11 3 33.07	9.012	6 2 15.3	56.24	2 2.70	0.842	11 5 35.77	
Mon.	9	11 7 9.29	9.006	5 39 42.5	56.48	2 23.03	0.850	11 9 32.32	
Tues.	10	11 10 45.34	8.998	5 17 3.9	-56.71	2 43.53	0.857	11 13 28.87	
Wed.	11	11 14 21.23	8.991	4 54 20.0	56.92	3 4.19	0.864	11 17 25.42	
Thur.	12	11 17 56.97	8.985	4 31 31.1	57.12	3 25.01	0.870	11 21 21.98	
Frid.	13	11 21 32.58	8.980	4 8 37.6	-57.30	3 45.95	0.875	11 25 18.53	
Sat.	14	11 25 8.08	8.976	3 45 39.8	57.48	4 7.00	0.879	11 29 15.08	
SUN.	15	11 28 43.49	8.973	3 22 38.0	57.65	4 28.15	0.882	11 33 11.64	
Mon.	16	11 32 18.82	8.971	2 59 32.6	-57.79	4 49.37	0.885	11 37 8.19	
Tues.	17	11 35 54.10	8.969	2 36 23.9	57.92	5 10.64	0.887	11 41 4.74	
Wed.	18	11 39 29.35	8.968	2 13 12.3	58.03	5 31.94	0.888	11 45 1.29	
Thur.	19	11 43 4.59	8.969	1 49 58.1	-58.13	5 53.26	0.887	11 48 57.85	
Frid.	20	11 46 39.85	8.970	1 26 41.6	58.23	6 14.55	0.886	11 52 54.40	
Sat.	21	11 50 15.14	8.972	1 3 23.0	58.31	6 35.81	0.884	11 56 50.95	
SUN.	22	11 53 50.50	8.975	0 40 2.9	-58.37	6 57.00	0.881	12 0 47.50	
Mon.	23	11 57 25.95	8.979	N. 0 16 41.3	58.42	7 18.11	0.877	12 4 44.06	
Tues.	24	12 1 1.52	8.985	S. 0 6 41.3	58.46	7 39.09	0.871	12 8 40.61	
Wed.	25	12 4 37.22	8.991	0 30 4.6	-58.48	7 59.94	0.865	12 12 37.16	
Thur.	26	12 8 13.08	8.998	0 53 28.4	58.49	8 20.63	0.858	12 16 33.71	
Frid.	27	12 11 49.12	9.006	1 16 52.1	58.49	8 41.15	0.850	12 20 30.27	
Sat.	28	12 15 25.37	9.015	1 40 15.7	-58.47	9 1.45	0.841	12 24 26.82	
SUN.	29	12 19 1.85	9.025	2 3 38.6	58.44	9 21.52	0.831	12 28 23.37	
Mon.	30	12 22 38.57	9.036	2 27 0.7	58.39	9 41.35	0.821	12 32 19.92	
Tues.	31	12 26 15.56	9.047	S. 2 50 21.4	-58.33	10 0.92	0.809	12 36 16.48	

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.

The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations increasing.

Diff. for 1 Hour,  
+ 9°.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	244	157 53 29.2	53 11.3	145.20	— 0.58	0.003 9178	— 42.0	h m s 13 19 48.72
2	245	158 51 35.0	51 17.0	145.28	0.47	0.003 8164	42.6	13 15 52.81
3	246	159 49 42.6	49 24.5	145.36	0.35	0.003 7135	43.2	13 11 56.90
4	247	160 47 52.2	47 34.0	145.44	— 0.23	0.003 6091	— 43.8	13 8 0.99
5	248	161 46 3.7	45 45.3	145.52	0.11	0.003 5033	44.4	13 4 5.09
6	249	162 44 16.9	43 58.5	145.60	— 0.01	0.003 3959	45.1	13 0 9.18
7	250	163 42 32.1	42 13.5	145.67	+ 0.08	0.003 2869	— 45.7	12 56 13.27
8	251	164 40 49.0	40 30.4	145.74	0.16	0.003 1764	46.4	12 52 17.37
9	252	165 39 7.6	38 48.9	145.81	0.20	0.003 0643	47.0	12 48 21.46
10	253	166 37 28.0	37 9.2	145.88	+ 0.22	0.002 9507	— 47.6	12 44 25.55
11	254	167 35 50.0	35 31.1	145.95	0.21	0.002 8357	48.2	12 40 29.65
12	255	168 34 13.7	33 54.7	146.02	0.15	0.002 7194	48.7	12 36 33.74
13	256	169 32 38.9	32 19.9	146.09	+ 0.08	0.002 6019	— 49.2	12 32 37.83
14	257	170 31 5.8	30 46.6	146.16	— 0.02	0.002 4833	49.6	12 28 41.92
15	258	171 29 34.2	29 14.9	146.22	0.13	0.002 3638	49.9	12 24 46.02
16	259	172 28 4.2	27 44.8	146.29	— 0.26	0.002 2436	— 50.2	12 20 50.11
17	260	173 26 35.8	26 16.3	146.35	0.40	0.002 1230	50.4	12 16 54.20
18	261	174 25 9.0	24 49.4	146.42	0.53	0.002 0019	50.5	12 12 58.30
19	262	175 23 43.9	23 24.2	146.49	— 0.65	0.001 8807	— 50.5	12 9 2.39
20	263	176 22 20.6	22 0.9	146.57	0.77	0.001 7594	50.5	12 5 6.48
21	264	177 20 59.1	20 39.3	146.65	0.87	0.001 6381	50.5	12 1 10.58
22	265	178 19 39.6	19 19.7	146.73	— 0.91	0.001 5169	— 50.5	11 57 14.67
23	266	179 18 22.0	18 2.1	146.81	0.94	0.001 3959	50.4	11 53 18.76
24	267	180 17 6.6	16 46.5	146.90	0.93	0.001 2749	50.4	11 49 22.86
25	268	181 15 53.3	15 33.1	146.99	— 0.90	0.001 1541	— 50.4	11 45 26.95
26	269	182 14 42.2	14 22.0	147.08	0.84	0.001 0332	50.4	11 41 31.04
27	270	183 13 33.3	13 13.0	147.18	0.75	0.000 9122	50.4	11 37 35.14
28	271	184 12 26.7	12 6.3	147.27	— 0.65	0.000 7911	— 50.5	11 33 39.23
29	272	185 11 22.4	11 1.9	147.37	0.54	0.000 6698	50.6	11 29 43.33
30	273	186 10 20.4	9 59.8	147.46	0.43	0.000 5482	50.7	11 25 47.42
31	274	187 9 20.6	8 59.9	147.56	— 0.31	0.000 4263	— 50.9	11 21 51.51
NOTE.—The longitudes in the column $\lambda$ are referred to the true equinox of their own date, while those in the column $\lambda'$ are referred to the mean equinox of the beginning of the Besselian fictitious year.								
Diff. for 1 Hour, — 0 <sup>s</sup> .8296. (Table II.)								

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	' "	' "	' "	"	' "	"	h m	m	d
1	14 48.8	14 47.5	54 15.9	- 0.51	54 11.0	- 0.30	19 49.4	2.02	23.2
2	14 46.8	14 46.8	54 8.6	- 0.11	54 8.4	+ 0.08	20 38.0	2.03	24.2
3	14 47.3	14 48.4	54 10.4	+ 0.26	54 14.5	0.41	21 26.5	2.01	25.2
4	14 50.0	14 52.0	54 20.4	+ 0.57	54 28.0	+ 0.70	22 14.3	1.98	26.2
5	14 54.6	14 57.5	54 37.1	0.82	54 47.4	0.91	23 1.3	1.94	27.2
6	15 0.6	15 3.9	54 59.0	1.00	55 11.4	1.07	23 47.4	1.90	28.2
7	15 7.5	15 11.3	55 24.6	+ 1.12	55 38.4	+ 1.17	6	.	29.2
8	15 15.2	15 19.1	55 52.6	1.19	56 7.2	1.21	0 32.8	1.89	0.6
9	15 23.1	15 27.2	56 21.9	1.23	56 36.7	1.24	1 18.1	1.89	1.6
10	15 31.2	15 35.2	56 51.5	+ 1.24	57 6.4	+ 1.23	2 3.9	1.93	2.6
11	15 39.3	15 43.2	57 21.1	1.22	57 35.7	1.21	2 51.0	2.00	3.6
12	15 47.2	15 51.1	57 50.2	1.20	58 4.5	1.18	3 40.1	2.10	4.6
13	15 54.9	15 58.6	58 18.5	+ 1.15	58 32.1	+ 1.12	4 32.0	2.23	5.6
14	16 2.2	16 5.6	58 45.4	1.08	58 58.0	1.02	5 27.0	2.36	6.6
15	16 8.9	16 11.8	59 9.9	0.95	59 20.8	0.86	6 24.8	2.46	7.6
16	16 14.5	16 16.7	59 30.4	+ 0.74	59 38.5	+ 0.60	7 24.5	2.51	8.6
17	16 18.4	16 19.6	59 44.9	0.44	59 49.2	+ 0.26	8 24.9	2.49	9.6
18	16 20.1	16 20.0	59 51.2	+ 0.05	59 50.5	- 0.16	9 24.0	2.42	10.6
19	16 19.1	16 17.3	59 47.2	- 0.40	59 41.0	- 0.64	10 20.7	2.30	11.6
20	16 15.0	16 11.7	59 32.0	0.87	59 20.2	1.10	11 14.5	2.19	12.6
21	16 7.7	16 3.2	59 5.7	1.30	58 48.9	1.49	12 5.8	2.09	13.6
22	15 58.0	15 52.4	58 30.0	- 1.65	58 9.4	- 1.76	12 55.0	2.02	14.6
23	15 46.5	15 40.3	57 47.6	1.85	57 25.0	1.90	13 43.0	1.98	15.6
24	15 34.1	15 27.9	57 2.1	1.90	56 39.3	1.87	14 30.3	1.97	16.6
25	15 21.9	15 16.1	56 17.1	- 1.81	55 55.9	- 1.72	15 17.7	1.98	17.6
26	15 10.7	15 5.7	55 36.0	1.59	55 17.8	1.43	16 5.5	2.00	18.6
27	15 1.3	14 57.4	55 1.6	1.26	54 47.5	1.08	16 53.7	2.02	19.6
28	14 54.2	14 51.7	54 35.7	- 0.88	54 26.5	- 0.67	17 42.3	2.03	20.6
29	14 49.8	14 48.7	54 19.7	0.45	54 15.6	- 0.24	18 31.1	2.03	21.6
30	14 48.3	14 48.6	54 14.1	- 0.02	54 15.2	+ 0.20	19 19.7	2.01	22.6
31	14 49.6	14 51.2	54 18.7	+ 0.39	54 24.7	+ 0.59	20 7.7	1.98	23.6

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 1.					TUESDAY 3.				
0	5 48 39.48	2.1096	N.21 13 7.0	3.002	0	7 30 30.04	2.1232	N.21 40 27.0	1.897
1	5 50 46.08	2.1105	21 16 4.2	2.903	1	7 32 37.42	2.1227	21 38 30.7	1.989
2	5 52 52.74	2.1113	21 18 55.4	2.804	2	7 34 44.77	2.1223	21 36 28.3	2.090
3	5 54 59.44	2.1121	21 21 40.7	2.704	3	7 36 52.10	2.1219	21 34 19.9	2.192
4	5 57 6.19	2.1130	21 24 19.9	2.604	4	7 38 59.40	2.1213	21 32 5.3	2.294
5	5 59 13.00	2.1138	21 26 53.2	2.505	5	7 41 6.66	2.1207	21 29 44.6	2.395
6	6 1 19.85	2.1146	21 29 20.5	2.404	6	7 43 13.89	2.1202	21 27 17.9	2.496
7	6 3 26.75	2.1153	21 31 41.7	2.303	7	7 45 21.08	2.1196	21 24 45.1	2.597
8	6 5 33.69	2.1160	21 33 56.9	2.203	8	7 47 28.24	2.1190	21 22 6.2	2.698
9	6 7 40.67	2.1167	21 36 6.1	2.102	9	7 49 35.36	2.1183	21 19 21.3	2.799
10	6 9 47.70	2.1175	21 38 9.2	2.001	10	7 51 42.44	2.1176	21 16 30.3	2.899
11	6 11 54.77	2.1181	21 40 6.2	1.900	11	7 53 49.47	2.1168	21 13 33.4	2.999
12	6 14 1.87	2.1187	21 41 57.2	1.799	12	7 55 56.46	2.1162	21 10 30.4	3.100
13	6 16 9.01	2.1193	21 43 42.1	1.698	13	7 58 3.41	2.1154	21 7 21.4	3.200
14	6 18 16.19	2.1200	21 45 21.0	1.597	14	8 0 10.31	2.1146	21 4 6.4	3.300
15	6 20 23.41	2.1206	21 46 53.7	1.494	15	8 2 17.16	2.1137	21 0 45.4	3.399
16	6 22 30.66	2.1211	21 48 20.3	1.392	16	8 4 23.96	2.1129	20 57 18.5	3.498
17	6 24 37.94	2.1216	21 49 40.8	1.291	17	8 6 30.71	2.1121	20 53 45.6	3.597
18	6 26 45.25	2.1220	21 50 55.2	1.189	18	8 8 37.41	2.1112	20 50 6.8	3.696
19	6 28 52.58	2.1224	21 52 3.5	1.087	19	8 10 44.05	2.1102	20 46 22.1	3.794
20	6 30 59.94	2.1229	21 53 5.7	0.985	20	8 12 50.63	2.1092	20 42 31.5	3.893
21	6 33 7.33	2.1234	21 54 1.7	0.882	21	8 14 57.16	2.1083	20 38 34.9	3.992
22	6 35 14.75	2.1238	21 54 51.6	0.780	22	8 17 3.63	2.1073	20 34 32.5	4.088
23	6 37 22.19	2.1241	N.21 55 35.3	0.677	23	8 19 10.04	2.1063	N.20 30 24.3	4.186
MONDAY 2.					WEDNESDAY 4.				
0	6 39 29.64	2.1243	N.21 56 12.9	0.575	0	8 21 16.39	2.1053	N.20 26 10.2	4.283
1	6 41 37.11	2.1247	21 56 44.3	0.472	1	8 23 22.68	2.1042	20 21 50.3	4.380
2	6 43 44.60	2.1250	21 57 9.6	0.371	2	8 25 28.90	2.1031	20 17 24.6	4.477
3	6 45 52.11	2.1252	21 57 28.8	0.268	3	8 27 35.05	2.1019	20 12 53.1	4.573
4	6 47 59.63	2.1254	21 57 41.8	0.165	4	8 29 41.13	2.1008	20 8 15.8	4.669
5	6 50 7.16	2.1256	21 57 48.6	+ 0.062	5	8 31 47.15	2.0997	20 3 32.8	4.764
6	6 52 14.70	2.1257	21 57 49.2	- 0.041	6	8 33 53.10	2.0986	19 58 44.1	4.860
7	6 54 22.25	2.1258	21 57 43.7	0.143	7	8 35 58.98	2.0974	19 53 49.6	4.955
8	6 56 29.80	2.1259	21 57 32.0	0.247	8	8 38 4.79	2.0962	19 48 49.5	5.049
9	6 58 37.36	2.1261	21 57 14.1	0.349	9	8 40 10.53	2.0950	19 43 43.7	5.144
10	7 0 44.93	2.1261	21 56 50.1	0.452	10	8 42 16.19	2.0937	19 38 32.2	5.237
11	7 2 52.49	2.1260	21 56 19.9	0.555	11	8 44 21.77	2.0924	19 33 15.2	5.331
12	7 5 0.05	2.1260	21 55 43.5	0.657	12	8 46 27.28	2.0912	19 27 52.5	5.424
13	7 7 7.61	2.1259	21 55 1.0	0.760	13	8 48 32.71	2.0898	19 22 24.3	5.517
14	7 9 15.16	2.1258	21 54 12.3	0.863	14	8 50 38.06	2.0886	19 16 50.5	5.609
15	7 11 22.71	2.1257	21 53 17.4	0.966	15	8 52 43.34	2.0873	19 11 11.2	5.701
16	7 13 30.25	2.1256	21 52 16.4	1.067	16	8 54 48.54	2.0860	19 5 26.4	5.792
17	7 15 37.78	2.1254	21 51 9.3	1.170	17	8 56 53.66	2.0846	18 59 36.1	5.884
18	7 17 45.30	2.1252	21 49 56.0	1.273	18	8 58 58.69	2.0832	18 53 40.3	5.975
19	7 19 52.80	2.1249	21 48 36.5	1.376	19	9 1 3.64	2.0818	18 47 39.1	6.064
20	7 22 0.29	2.1247	21 47 10.9	1.478	20	9 3 8.51	2.0805	18 41 32.6	6.154
21	7 24 7.76	2.1243	21 45 39.1	1.581	21	9 5 13.30	2.0792	18 35 20.6	6.245
22	7 26 15.21	2.1240	21 44 1.2	1.682	22	9 7 18.01	2.0777	18 29 3.2	6.333
23	7 28 22.64	2.1236	21 42 17.2	1.785	23	9 9 22.63	2.0762	18 22 40.6	6.422
24	7 30 30.04	2.1232	N.21 40 27.0	1.887	24	9 11 27.16	2.0748	N.18 16 12.6	6.510



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 5.					SATURDAY 7.				
0	9 11 27.16	2.0748	N. 18 16 12.6	6.510	0	10 49 24.35	2.0097	N. 11 32 21.3	10.087
1	9 13 31.61	2.0734	18 9 39.4	6.597	1	10 51 24.90	2.0087	11 22 14.3	10.145
2	9 15 35.97	2.0720	18 3 0.9	6.685	2	10 53 25.40	2.0077	11 12 3.9	10.202
3	9 17 40.25	2.0706	17 56 17.2	6.772	3	10 55 25.83	2.0067	11 1 50.0	10.261
4	9 19 44.44	2.0691	17 49 28.3	6.858	4	10 57 26.20	2.0057	10 51 32.6	10.317
5	9 21 48.54	2.0677	17 42 34.2	6.944	5	10 59 26.52	2.0049	10 41 11.9	10.372
6	9 23 52.56	2.0662	17 35 35.0	7.029	6	11 1 26.79	2.0040	10 30 47.9	10.427
7	9 25 56.48	2.0647	17 28 30.7	7.113	7	11 3 27.00	2.0031	10 20 20.6	10.482
8	9 28 0.32	2.0632	17 21 21.4	7.197	8	11 5 27.16	2.0023	10 9 50.0	10.537
9	9 30 4.07	2.0618	17 14 7.0	7.282	9	11 7 27.28	2.0015	9 59 16.2	10.589
10	9 32 7.74	2.0603	17 6 47.6	7.365	10	11 9 27.34	2.0007	9 48 39.3	10.641
11	9 34 11.31	2.0588	16 59 23.2	7.447	11	11 11 27.36	2.0000	9 37 59.3	10.692
12	9 36 14.80	2.0574	16 51 53.9	7.529	12	11 13 27.34	1.9993	9 27 16.3	10.742
13	9 38 18.20	2.0559	16 44 19.7	7.611	13	11 15 27.28	1.9986	9 16 30.2	10.792
14	9 40 21.51	2.0544	16 36 40.6	7.692	14	11 17 27.17	1.9979	9 5 41.2	10.842
15	9 42 24.73	2.0529	16 28 56.7	7.772	15	11 19 27.03	1.9973	8 54 49.2	10.890
16	9 44 27.86	2.0515	16 21 7.9	7.852	16	11 21 26.85	1.9967	8 43 54.4	10.937
17	9 46 30.91	2.0501	16 13 14.4	7.932	17	11 23 26.63	1.9961	8 32 56.7	10.984
18	9 48 33.87	2.0486	16 5 16.1	8.011	18	11 25 26.38	1.9957	8 21 56.3	11.030
19	9 50 36.74	2.0471	15 57 13.1	8.089	19	11 27 26.11	1.9952	8 10 53.1	11.075
20	9 52 39.52	2.0456	15 49 5.4	8.167	20	11 29 25.81	1.9947	7 59 47.3	11.119
21	9 54 42.21	2.0442	15 40 53.1	8.243	21	11 31 25.48	1.9942	7 48 38.8	11.163
22	9 56 44.82	2.0428	15 32 36.2	8.320	22	11 33 25.12	1.9938	7 37 27.7	11.206
23	9 58 47.35	2.0413	N. 15 24 14.7	8.396	23	11 35 24.74	1.9936	N. 7 26 14.1	11.247
FRIDAY 6.					SUNDAY 8.				
0	10 0 49.78	2.0398	N. 15 15 48.7	8.471	0	11 37 24.35	1.9933	N. 7 14 58.0	11.289
1	10 2 52.13	2.0385	15 7 18.2	8.546	1	11 39 23.94	1.9930	7 3 39.4	11.329
2	10 4 54.40	2.0371	14 58 43.2	8.620	2	11 41 23.51	1.9927	6 52 18.5	11.368
3	10 6 56.58	2.0357	14 50 3.8	8.693	3	11 43 23.07	1.9926	6 40 55.2	11.407
4	10 8 58.68	2.0342	14 41 20.0	8.767	4	11 45 22.62	1.9924	6 29 29.6	11.446
5	10 11 0.69	2.0328	14 32 31.8	8.839	5	11 47 22.16	1.9923	6 18 1.7	11.483
6	10 13 2.62	2.0315	14 23 39.3	8.910	6	11 49 21.70	1.9922	6 6 31.6	11.519
7	10 15 4.47	2.0302	14 14 42.6	8.981	7	11 51 21.23	1.9922	5 54 59.4	11.554
8	10 17 6.24	2.0288	14 5 41.6	9.052	8	11 53 20.76	1.9922	5 43 25.1	11.588
9	10 19 7.93	2.0275	13 56 36.4	9.122	9	11 55 20.29	1.9922	5 31 48.8	11.622
10	10 21 9.54	2.0262	13 47 27.0	9.191	10	11 57 19.83	1.9923	5 20 10.5	11.655
11	10 23 11.07	2.0249	13 38 13.5	9.258	11	11 59 19.37	1.9924	5 8 30.2	11.687
12	10 25 12.53	2.0237	13 28 56.0	9.326	12	12 1 18.92	1.9926	4 56 48.0	11.718
13	10 27 13.91	2.0223	13 19 34.4	9.393	13	12 3 18.48	1.9928	4 45 4.0	11.748
14	10 29 15.21	2.0211	13 10 8.8	9.460	14	12 5 18.06	1.9931	4 33 18.2	11.778
15	10 31 16.44	2.0199	13 0 39.2	9.526	15	12 7 17.65	1.9933	4 21 30.6	11.807
16	10 33 17.60	2.0187	12 51 5.7	9.591	16	12 9 17.26	1.9937	4 9 41.4	11.834
17	10 35 18.68	2.0174	12 41 28.3	9.656	17	12 11 16.89	1.9941	3 57 50.5	11.862
18	10 37 19.69	2.0163	12 31 47.0	9.719	18	12 13 16.55	1.9945	3 45 58.0	11.887
19	10 39 20.64	2.0152	12 22 2.0	9.782	19	12 15 16.23	1.9949	3 34 4.0	11.912
20	10 41 21.51	2.0140	12 12 13.2	9.844	20	12 17 15.94	1.9955	3 22 8.5	11.937
21	10 43 22.32	2.0129	12 2 20.7	9.906	21	12 19 15.69	1.9961	3 10 11.6	11.960
22	10 45 23.06	2.0118	11 52 24.5	9.967	22	12 21 15.47	1.9966	2 58 13.3	11.982
23	10 47 23.74	2.0107	11 42 24.7	10.027	23	12 23 15.28	1.9972	2 46 13.7	12.004
24	10 49 24.35	2.0097	N. 11 32 21.3	10.087	24	12 25 15.14	1.9980	N. 2 34 12.8	12.025

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 9.					WEDNESDAY 11.				
0	12 25 15.14	1.9980	N. 2 34 12.8	12.025	0	14 2 53.24	2.0896	S. 7 8 47.4	11.886
1	12 27 15.04	1.9987	2 22 10.7	12.044	1	14 4 58.71	2.0927	7 20 39.7	11.857
2	12 29 14.99	1.9995	2 10 7.5	12.062	2	14 7 4.37	2.0959	7 32 30.3	11.829
3	12 31 14.98	2.0003	1 58 3.2	12.081	3	14 9 10.22	2.0992	7 44 19.2	11.799
4	12 33 15.03	2.0012	1 45 57.8	12.098	4	14 11 16.27	2.1025	7 56 6.2	11.767
5	12 35 15.13	2.0022	1 33 51.4	12.114	5	14 13 22.52	2.1058	8 7 51.2	11.734
6	12 37 15.29	2.0032	1 21 44.1	12.129	6	14 15 28.97	2.1092	8 19 34.3	11.702
7	12 39 15.51	2.0042	1 9 35.9	12.143	7	14 17 35.63	2.1127	8 31 15.4	11.667
8	12 41 15.79	2.0052	0 57 26.9	12.157	8	14 19 42.49	2.1162	8 42 54.3	11.630
9	12 43 16.14	2.0064	0 45 17.1	12.169	9	14 21 49.57	2.1197	8 54 31.0	11.593
10	12 45 16.56	2.0076	0 33 6.6	12.181	10	14 23 56.86	2.1232	9 6 5.5	11.556
11	12 47 17.05	2.0087	0 20 55.4	12.191	11	14 26 4.36	2.1269	9 17 37.7	11.517
12	12 49 17.61	2.0100	N. 0 8 43.7	12.200	12	14 28 12.09	2.1307	9 29 7.5	11.476
13	12 51 18.25	2.0113	S. 0 3 28.6	12.209	13	14 30 20.04	2.1343	9 40 34.8	11.434
14	12 53 18.97	2.0127	0 15 41.4	12.217	14	14 32 28.21	2.1381	9 51 59.6	11.392
15	12 55 19.78	2.0142	0 27 54.6	12.223	15	14 34 36.61	2.1419	10 3 21.8	11.348
16	12 57 20.67	2.0156	0 40 8.2	12.229	16	14 36 45.24	2.1458	10 14 41.4	11.304
17	12 59 21.65	2.0171	0 52 22.1	12.234	17	14 38 54.11	2.1497	10 25 58.3	11.257
18	13 1 22.72	2.0187	1 4 36.3	12.238	18	14 41 3.21	2.1536	10 37 12.3	11.210
19	13 3 23.89	2.0203	1 16 50.7	12.242	19	14 43 12.54	2.1576	10 48 23.5	11.162
20	13 5 25.16	2.0220	1 29 5.3	12.243	20	14 45 22.12	2.1617	10 59 31.7	11.112
21	13 7 26.53	2.0237	1 41 19.9	12.243	21	14 47 31.94	2.1657	11 10 36.9	11.062
22	13 9 28.01	2.0255	1 53 34.5	12.243	22	14 49 42.01	2.1699	11 21 39.1	11.010
23	13 11 29.59	2.0273	S. 2 5 49.1	12.243	23	14 51 52.33	2.1740	S. 11 32 38.1	10.957
TUESDAY 10.					THURSDAY 12.				
0	13 13 31.28	2.0292	S. 2 18 3.7	12.242	0	14 54 2.89	2.1782	S. 11 43 33.9	10.902
1	13 15 33.09	2.0311	2 30 18.1	12.238	1	14 56 13.71	2.1824	11 54 26.4	10.847
2	13 17 35.01	2.0331	2 42 32.3	12.234	2	14 58 24.78	2.1867	12 5 15.5	10.790
3	13 19 37.06	2.0352	2 54 46.2	12.229	3	15 0 36.11	2.1910	12 16 1.2	10.733
4	13 21 39.23	2.0372	3 6 59.8	12.223	4	15 2 47.70	2.1953	12 26 43.5	10.674
5	13 23 41.52	2.0393	3 19 13.0	12.217	5	15 4 59.55	2.1997	12 37 22.1	10.613
6	13 25 43.94	2.0415	3 31 25.8	12.208	6	15 7 11.67	2.2042	12 47 57.1	10.552
7	13 27 46.50	2.0437	3 43 38.0	12.198	7	15 9 24.05	2.2086	12 58 28.3	10.489
8	13 29 49.19	2.0460	3 55 49.6	12.188	8	15 11 36.70	2.2131	13 8 55.8	10.426
9	13 31 52.02	2.0483	4 8 0.6	12.178	9	15 13 49.62	2.2176	13 19 19.4	10.361
10	13 33 54.99	2.0507	4 20 11.0	12.167	10	15 16 2.81	2.2221	13 29 39.1	10.294
11	13 35 58.11	2.0532	4 32 20.6	12.153	11	15 18 16.27	2.2267	13 39 54.7	10.227
12	13 38 1.38	2.0557	4 44 29.3	12.138	12	15 20 30.01	2.2313	13 50 6.3	10.158
13	13 40 4.80	2.0582	4 56 37.2	12.123	13	15 22 44.03	2.2359	14 0 13.7	10.088
14	13 42 8.37	2.0608	5 8 44.1	12.107	14	15 24 58.32	2.2405	14 10 16.9	10.017
15	13 44 12.10	2.0635	5 20 50.0	12.089	15	15 27 12.89	2.2452	14 20 15.8	9.945
16	13 46 15.99	2.0662	5 32 54.8	12.070	16	15 29 27.75	2.2500	14 30 10.3	9.872
17	13 48 20.04	2.0689	5 44 58.6	12.050	17	15 31 42.89	2.2547	14 40 0.4	9.797
18	13 50 24.26	2.0717	5 57 1.1	12.031	18	15 33 58.31	2.2594	14 49 46.0	9.721
19	13 52 28.65	2.0746	6 9 2.3	12.009	19	15 36 14.02	2.2642	14 59 26.9	9.643
20	13 54 33.21	2.0775	6 21 2.2	11.987	20	15 38 30.02	2.2690	15 9 3.2	9.565
21	13 56 37.95	2.0804	6 33 0.8	11.964	21	15 40 46.30	2.2738	15 18 34.7	9.486
22	13 58 42.86	2.0834	6 44 57.9	11.938	22	15 43 2.87	2.2787	15 28 1.5	9.405
23	14 0 47.96	2.0865	6 56 53.4	11.912	23	15 45 19.74	2.2835	15 37 23.3	9.322
24	14 2 53.24	2.0896	S. 7 8 47.4	11.886	24	15 47 36.89	2.2883	S. 15 46 40.2	9.239

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 13.					SUNDAY 15.				
0	15 47 36.89	2.2883	S. 15 46 40.2	9.239	0	17 42 57.46	2.5073	S. 21 11 36.3	3.872
1	15 49 54.34	2.2932	15 55 52.0	9.155	1	17 45 28.01	2.5108	21 15 24.5	3.735
2	15 52 12.08	2.2981	16 4 58.8	9.069	2	17 47 58.76	2.5142	21 19 4.5	3.597
3	15 54 30.11	2.3030	16 14 0.3	8.982	3	17 50 29.72	2.5177	21 22 36.2	3.458
4	15 56 48.44	2.3079	16 22 56.6	8.894	4	17 53 0.88	2.5210	21 25 59.5	3.319
5	15 59 7.06	2.3128	16 31 47.6	8.805	5	17 55 32.24	2.5244	21 29 14.5	3.179
6	16 1 25.98	2.3177	16 40 33.2	8.714	6	17 58 3.79	2.5273	21 32 21.0	3.038
7	16 3 45.19	2.3227	16 49 13.3	8.622	7	18 0 35.52	2.5303	21 35 19.1	2.897
8	16 6 4.70	2.3276	16 57 47.8	8.529	8	18 3 7.43	2.5333	21 38 8.6	2.754
9	16 8 24.50	2.3325	17 6 16.8	8.435	9	18 5 39.52	2.5362	21 40 49.6	2.612
10	16 10 44.60	2.3374	17 14 40.0	8.339	10	18 8 11.78	2.5391	21 43 22.0	2.468
11	16 13 4.99	2.3423	17 22 57.5	8.242	11	18 10 44.21	2.5418	21 45 45.8	2.324
12	16 15 25.68	2.3472	17 31 9.1	8.144	12	18 13 16.80	2.5444	21 48 0.9	2.179
13	16 17 46.66	2.3522	17 39 14.8	8.045	13	18 15 49.54	2.5470	21 50 7.3	2.034
14	16 20 7.94	2.3572	17 47 14.5	7.945	14	18 18 22.44	2.5495	21 52 5.0	1.888
15	16 22 29.52	2.3621	17 55 8.2	7.844	15	18 20 55.48	2.5518	21 53 53.9	1.742
16	16 24 51.39	2.3669	18 2 55.8	7.741	16	18 23 28.66	2.5541	21 55 34.0	1.594
17	16 27 13.55	2.3718	18 10 37.1	7.637	17	18 26 1.97	2.5562	21 57 5.2	1.447
18	16 29 36.01	2.3767	18 18 12.2	7.532	18	18 28 35.40	2.5582	21 58 27.6	1.299
19	16 31 58.75	2.3815	18 25 41.0	7.426	19	18 31 8.96	2.5603	21 59 41.1	1.151
20	16 34 21.79	2.3863	18 33 3.3	7.318	20	18 33 42.64	2.5622	22 0 45.7	1.002
21	16 36 45.11	2.3912	18 40 19.2	7.210	21	18 36 16.42	2.5639	22 1 41.4	0.853
22	16 39 8.73	2.3960	18 47 28.5	7.100	22	18 38 50.31	2.5656	22 2 28.1	0.703
23	16 41 32.63	2.4007	S. 18 54 31.2	6.989	23	18 41 24.29	2.5672	S. 22 3 5.8	0.553
SATURDAY 14.					MONDAY 16.				
0	16 43 56.82	2.4055	S. 19 1 27.2	6.877	0	18 43 58.37	2.5687	S. 22 3 34.5	0.403
1	16 46 21.29	2.4102	19 8 16.5	6.764	1	18 46 32.53	2.5701	22 3 54.2	0.253
2	16 48 46.05	2.4150	19 14 58.9	6.649	2	18 49 6.78	2.5713	22 4 4.9	-0.102
3	16 51 11.09	2.4197	19 21 34.4	6.534	3	18 51 41.09	2.5724	22 4 6.5	+0.048
4	16 53 36.41	2.4242	19 28 3.0	6.417	4	18 54 15.47	2.5735	22 3 59.1	0.199
5	16 56 2.00	2.4288	19 34 24.5	6.300	5	18 56 49.91	2.5745	22 3 42.6	0.351
6	16 58 27.87	2.4334	19 40 39.0	6.182	6	18 59 24.41	2.5753	22 3 17.0	0.502
7	17 0 54.01	2.4379	19 46 46.3	6.062	7	19 1 58.95	2.5761	22 2 42.3	0.653
8	17 3 20.42	2.4424	19 52 46.4	5.941	8	19 4 33.54	2.5767	22 1 58.6	0.805
9	17 5 47.10	2.4468	19 58 39.2	5.819	9	19 7 8.16	2.5772	22 1 5.7	0.957
10	17 8 14.04	2.4512	20 4 24.7	5.696	10	19 9 42.81	2.5777	22 0 3.8	1.108
11	17 10 41.25	2.4557	20 10 2.7	5.572	11	19 12 17.48	2.5780	21 58 52.7	1.260
12	17 13 8.72	2.4600	20 15 33.3	5.447	12	19 14 52.17	2.5782	21 57 32.6	1.411
13	17 15 36.45	2.4642	20 20 56.4	5.321	13	19 17 26.87	2.5783	21 56 3.4	1.563
14	17 18 4.43	2.4684	20 26 11.8	5.193	14	19 20 1.57	2.5783	21 54 25.0	1.715
15	17 20 32.66	2.4726	20 31 19.6	5.066	15	19 22 36.27	2.5782	21 52 37.6	1.866
16	17 23 1.14	2.4767	20 36 19.7	4.937	16	19 25 10.96	2.5781	21 50 41.1	2.017
17	17 25 29.86	2.4807	20 41 12.1	4.807	17	19 27 45.64	2.5777	21 48 35.5	2.168
18	17 27 58.82	2.4847	20 45 56.6	4.676	18	19 30 20.29	2.5772	21 46 20.9	2.318
19	17 30 28.02	2.4887	20 50 33.2	4.544	19	19 32 54.91	2.5767	21 43 57.3	2.469
20	17 32 57.46	2.4926	20 55 1.9	4.412	20	19 35 29.50	2.5762	21 41 24.6	2.621
21	17 35 27.13	2.4963	20 59 22.6	4.278	21	19 38 4.05	2.5754	21 38 42.8	2.771
22	17 37 57.02	2.5000	21 3 35.3	4.144	22	19 40 38.55	2.5746	21 35 52.1	2.920
23	17 40 27.13	2.5037	21 7 39.9	4.008	23	19 43 13.00	2.5737	21 32 52.4	3.069
24	17 42 57.46	2.5073	S. 21 11 36.3	3.872	24	19 45 47.39	2.5727	S. 21 29 43.8	3.218

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 17.					THURSDAY 19.				
0	19 45 47.39	2.5727	S. 21 29 43.8	3.218	0	21 46 25.62	2.4281	S. 16 16 41.5	9.449
1	19 48 21.72	2.5715	21 26 26.2	3.367	1	21 48 51.18	2.4238	16 7 11.5	9.551
2	19 50 55.97	2.5702	21 22 59.7	3.516	2	21 51 16.48	2.4195	15 57 35.4	9.652
3	19 53 30.14	2.5688	21 19 24.3	3.663	3	21 53 41.52	2.4151	15 47 53.3	9.750
4	19 56 4.23	2.5674	21 15 40.1	3.811	4	21 56 6.29	2.4107	15 38 5.4	9.848
5	19 58 38.23	2.5659	21 11 47.0	3.957	5	21 58 30.81	2.4065	15 28 11.6	9.945
6	20 1 12.14	2.5642	21 7 45.2	4.103	6	22 0 55.07	2.4021	15 18 12.0	10.040
7	20 3 45.94	2.5625	21 3 34.6	4.250	7	22 3 19.06	2.3977	15 8 6.8	10.133
8	20 6 19.64	2.5607	20 59 15.2	4.395	8	22 5 42.79	2.3932	14 57 56.0	10.225
9	20 8 53.23	2.5588	20 54 47.2	4.539	9	22 8 6.25	2.3888	14 47 39.8	10.315
10	20 11 26.70	2.5567	20 50 10.5	4.683	10	22 10 29.45	2.3844	14 37 18.2	10.405
11	20 14 0.04	2.5547	20 45 25.2	4.827	11	22 12 52.38	2.3799	14 26 51.2	10.493
12	20 16 33.26	2.5525	20 40 31.3	4.969	12	22 15 15.04	2.3755	14 16 19.0	10.579
13	20 19 6.34	2.5502	20 35 28.9	5.111	13	22 17 37.44	2.3711	14 5 41.7	10.663
14	20 21 39.28	2.5478	20 30 18.0	5.252	14	22 19 59.57	2.3667	13 54 59.4	10.747
15	20 24 12.08	2.5454	20 24 58.7	5.392	15	22 22 21.44	2.3622	13 44 12.1	10.829
16	20 26 44.73	2.5428	20 19 31.0	5.532	16	22 24 43.04	2.3577	13 33 19.9	10.909
17	20 29 17.22	2.5402	20 13 54.9	5.671	17	22 27 4.37	2.3533	13 22 23.0	10.987
18	20 31 49.55	2.5375	20 8 10.5	5.808	18	22 29 25.44	2.3489	13 11 21.4	11.064
19	20 34 21.72	2.5347	20 2 17.9	5.945	19	22 31 46.24	2.3445	13 0 15.3	11.140
20	20 36 53.72	2.5319	19 56 17.1	6.082	20	22 34 6.78	2.3401	12 49 4.6	11.215
21	20 39 25.55	2.5290	19 50 8.1	6.217	21	22 36 27.05	2.3357	12 37 49.5	11.287
22	20 41 57.20	2.5260	19 43 51.1	6.351	22	22 38 47.06	2.3313	12 26 30.1	11.358
23	20 44 28.67	2.5229	S. 19 37 26.0	6.484	23	22 41 6.81	2.3269	S. 12 15 6.5	11.428
WEDNESDAY 18.					FRIDAY 20.				
0	20 46 59.95	2.5197	S. 19 30 53.0	6.616	0	22 43 26.29	2.3225	S. 12 3 38.7	11.497
1	20 49 31.04	2.5166	19 24 12.1	6.747	1	22 45 45.51	2.3182	11 52 6.9	11.565
2	20 52 1.94	2.5133	19 17 23.3	6.878	2	22 48 4.48	2.3139	11 40 31.2	11.628
3	20 54 32.64	2.5099	19 10 26.7	7.007	3	22 50 23.18	2.3095	11 28 51.6	11.692
4	20 57 3.13	2.5065	19 3 22.4	7.135	4	22 52 41.62	2.3052	11 17 8.2	11.754
5	20 59 33.42	2.5031	18 56 10.5	7.262	5	22 54 59.81	2.3010	11 5 21.1	11.814
6	21 2 3.50	2.4996	18 48 51.0	7.388	6	22 57 17.74	2.2967	10 53 30.5	11.873
7	21 4 33.37	2.4960	18 41 23.9	7.513	7	22 59 35.42	2.2925	10 41 36.4	11.931
8	21 7 3.02	2.4923	18 33 49.4	7.637	8	23 1 52.84	2.2882	10 29 38.8	11.987
9	21 9 32.45	2.4887	18 26 7.4	7.760	9	23 4 10.01	2.2841	10 17 37.9	12.042
10	21 12 1.66	2.4849	18 18 18.2	7.881	10	23 6 26.93	2.2799	10 5 33.8	12.094
11	21 14 30.64	2.4811	18 10 21.7	8.002	11	23 8 43.60	2.2757	9 53 26.6	12.146
12	21 16 59.39	2.4772	18 2 18.0	8.121	12	23 11 0.02	2.2717	9 41 16.3	12.196
13	21 19 27.91	2.4733	17 54 7.2	8.238	13	23 13 16.20	2.2676	9 29 3.1	12.244
14	21 21 56.19	2.4694	17 45 49.4	8.355	14	23 15 32.13	2.2635	9 16 47.0	12.292
15	21 24 24.24	2.4655	17 37 24.6	8.470	15	23 17 47.82	2.2595	9 4 28.1	12.337
16	21 26 52.05	2.4614	17 28 53.0	8.583	16	23 20 3.27	2.2555	8 52 6.6	12.380
17	21 29 19.61	2.4573	17 20 14.6	8.697	17	23 22 18.48	2.2515	8 39 42.5	12.423
18	21 31 46.93	2.4533	17 11 29.4	8.808	18	23 24 33.45	2.2476	8 27 15.8	12.465
19	21 34 14.01	2.4492	17 2 37.6	8.918	19	23 26 48.19	2.2437	8 14 46.7	12.504
20	21 36 40.84	2.4450	16 53 39.2	9.027	20	23 29 2.70	2.2398	8 2 15.3	12.542
21	21 39 7.41	2.4408	16 44 34.3	9.135	21	23 31 16.97	2.2360	7 49 41.7	12.578
22	21 41 33.74	2.4367	16 35 23.0	9.241	22	23 33 31.02	2.2322	7 37 5.9	12.614
23	21 43 59.81	2.4323	16 26 5.4	9.346	23	23 35 44.84	2.2285	7 24 28.0	12.647
24	21 46 25.62	2.4281	S. 16 16 41.5	9.449	24	23 37 58.44	2.2249	S. 7 11 48.2	12.679

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 21.					MONDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	23 37 58.44	2.2249	S. 7 11 48.2	12.679	1	21 18.15	2.0982	N. 3 7 49.8	12.648
2	23 40 11.83	2.2212	6 59 6.5	12.710	2	23 24.00	2.0967	3 20 27.8	12.618
3	23 42 24.99	2.2176	6 46 23.0	12.740	3	25 29.76	2.0952	3 33 4.0	12.587
4	23 44 37.94	2.2140	6 33 37.7	12.768	4	27 35.43	2.0939	3 45 38.3	12.556
5	23 46 50.67	2.2104	6 20 50.8	12.794	5	29 41.03	2.0926	3 58 10.7	12.522
6	23 49 3.19	2.2068	6 8 2.4	12.818	6	31 46.54	2.0912	4 10 41.0	12.488
7	23 51 15.49	2.2033	5 55 12.6	12.842	7	33 51.97	2.0899	4 23 9.3	12.453
8	23 53 27.59	2.1999	5 42 21.4	12.865	8	35 57.33	2.0887	4 35 35.4	12.417
9	23 55 39.48	2.1964	5 29 28.8	12.886	9	38 2.62	2.0876	4 47 59.3	12.379
10	23 57 51.16	2.1930	5 16 35.1	12.904	10	40 7.84	2.0864	5 0 20.9	12.341
11	0 0 2.64	2.1897	5 3 40.3	12.922	11	42 12.99	2.0852	5 12 40.2	12.302
12	0 2 13.92	2.1864	4 50 44.4	12.939	12	44 18.07	2.0842	5 24 57.2	12.262
13	0 4 25.01	2.1833	4 37 47.6	12.954	13	46 23.10	2.0833	5 37 11.7	12.221
14	0 6 35.92	2.1802	4 24 49.9	12.967	14	48 28.07	2.0823	5 49 23.7	12.179
15	0 8 46.63	2.1770	4 11 51.5	12.980	15	50 32.98	2.0813	6 1 33.2	12.136
16	0 10 57.16	2.1740	3 58 52.3	12.992	16	52 37.83	2.0805	6 13 40.0	12.092
17	0 13 7.51	2.1709	3 45 52.5	13.001	17	54 42.64	2.0797	6 25 44.2	12.047
18	0 15 17.67	2.1679	3 32 52.2	13.009	18	56 47.39	2.0788	6 37 45.7	12.002
19	0 17 27.66	2.1650	3 19 51.4	13.017	19	58 52.10	2.0781	6 49 44.4	11.955
20	0 19 37.47	2.1621	3 6 50.2	13.022	20	0 56.76	2.0774	7 1 40.3	11.907
21	0 21 47.11	2.1592	2 53 48.7	13.027	21	2 1.39	2.0767	7 13 33.3	11.858
22	0 23 56.57	2.1563	2 40 47.0	13.030	22	2 5.97	2.0761	7 25 23.3	11.809
23	0 26 5.87	2.1537	2 27 45.1	13.032	23	2 10.52	2.0755	7 37 10.4	11.759
24	0 28 15.01	2.1509	S. 2 14 43.1	13.032	24	2 15.03	2.0749	N. 7 48 54.4	11.707
SUNDAY 22.					TUESDAY 24.				
0	0 30 23.98	2.1482	S. 2 1 41.2	13.031	0	2 11 19.51	2.0744	N. 8 0 35.3	11.656
1	0 32 32.80	2.1457	1 48 39.4	13.029	1	2 13 23.96	2.0740	8 12 13.1	11.603
2	0 34 41.46	2.1430	1 35 37.7	13.026	2	2 15 28.39	2.0735	8 23 47.7	11.549
3	0 36 49.96	2.1404	1 22 36.3	13.021	3	2 17 32.78	2.0731	8 35 19.0	11.495
4	0 38 58.31	2.1380	1 9 35.2	13.016	4	2 19 37.16	2.0728	8 46 47.1	11.440
5	0 41 6.52	2.1356	0 56 34.4	13.009	5	2 21 41.52	2.0724	8 58 11.8	11.383
6	0 43 14.58	2.1332	0 43 34.1	13.000	6	2 23 45.85	2.0721	9 9 33.1	11.327
7	0 45 22.50	2.1308	0 30 34.4	12.990	7	2 25 50.17	2.0719	9 20 51.0	11.269
8	0 47 30.28	2.1286	0 17 35.3	12.979	8	2 27 54.48	2.0717	9 32 5.4	11.210
9	0 49 37.93	2.1263	S. 0 4 36.9	12.967	9	2 29 58.78	2.0715	9 43 16.2	11.151
10	0 51 45.44	2.1241	N. 0 8 20.8	12.954	10	2 32 3.06	2.0713	9 54 23.5	11.092
11	0 53 52.82	2.1219	0 21 17.6	12.940	11	2 34 7.34	2.0713	10 5 27.2	11.030
12	0 56 0.07	2.1198	0 34 13.6	12.925	12	2 36 11.61	2.0712	10 16 27.1	10.968
13	0 58 7.20	2.1177	0 47 8.6	12.907	13	2 38 15.88	2.0711	10 27 23.4	10.907
14	1 0 14.20	2.1157	1 0 2.5	12.890	14	2 40 20.14	2.0711	10 38 15.9	10.843
15	1 2 21.09	2.1138	1 12 55.4	12.872	15	2 42 24.41	2.0712	10 49 4.6	10.779
16	1 4 27.86	2.1118	1 25 47.1	12.851	16	2 44 28.68	2.0712	10 59 49.4	10.714
17	1 6 34.51	2.1099	1 38 37.5	12.829	17	2 46 32.95	2.0712	11 10 30.3	10.650
18	1 8 41.05	2.1082	1 51 26.6	12.807	18	2 48 37.23	2.0713	11 21 7.4	10.584
19	1 10 47.49	2.1064	2 4 14.3	12.782	19	2 50 41.51	2.0715	11 31 40.4	10.517
20	1 12 53.82	2.1047	2 17 0.5	12.758	20	2 52 45.81	2.0717	11 42 9.4	10.450
21	1 15 0.05	2.1030	2 29 45.3	12.733	21	2 54 50.11	2.0718	11 52 34.4	10.382
22	1 17 6.18	2.1013	2 42 28.5	12.706	22	2 56 54.43	2.0721	12 2 55.3	10.313
23	1 19 12.21	2.0997	2 55 10.0	12.677	23	2 58 58.76	2.0723	12 13 12.0	10.244
24	1 21 18.15	2.0982	N. 3 7 49.8	12.648	24	3 1 3.11	2.0727	N. 12 23 24.6	10.174

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 25.					FRIDAY 27.				
0	h m s	s	N. 12 23 24.6	10.174	0	h m s	s	N. 19 0 2.9	6.162
1	3 1 3.11	2.0727	12 33 32.9	10.102	1	4 41 13.85	2.1061	19 6 9.8	6.067
2	3 3 7.48	2.0729	12 43 36.9	10.032	2	4 43 20.24	2.1069	19 12 11.0	5.972
3	3 5 11.86	2.0732	12 53 36.7	9.960	3	4 45 26.68	2.1077	19 18 6.5	5.877
4	3 7 16.27	2.0736	13 3 32.1	9.887	4	4 47 33.17	2.1086	19 23 56.3	5.782
5	3 9 20.69	2.0739	13 13 23.1	9.813	5	4 49 39.71	2.1094	19 29 40.3	5.686
6	3 11 25.14	2.0744	13 23 9.7	9.740	6	4 51 46.30	2.1102	19 35 18.6	5.590
7	3 13 29.62	2.0748	13 32 51.9	9.666	7	4 53 52.94	2.1111	19 40 51.1	5.493
8	3 15 34.12	2.0752	13 42 29.6	9.590	8	4 55 59.63	2.1119	19 46 17.8	5.397
9	3 17 38.65	2.0757	13 52 2.7	9.514	9	4 58 6.37	2.1127	19 51 38.7	5.299
10	3 19 43.21	2.0762	14 1 31.3	9.438	10	5 0 13.15	2.1135	19 56 53.7	5.202
11	3 21 47.80	2.0768	14 10 55.3	9.361	11	5 2 19.99	2.1143	20 2 2.9	5.105
12	3 23 52.43	2.0773	14 20 14.6	9.283	12	5 4 26.87	2.1151	20 7 6.3	5.007
13	3 25 57.08	2.0778	14 29 29.3	9.206	13	5 6 33.80	2.1159	20 12 3.8	4.909
14	3 28 1.77	2.0784	14 38 39.3	9.127	14	5 8 40.78	2.1167	20 16 55.4	4.810
15	3 30 6.49	2.0790	14 47 44.5	9.047	15	5 10 47.80	2.1173	20 21 41.0	4.711
16	3 32 11.25	2.0797	14 56 45.0	8.968	16	5 12 54.86	2.1181	20 26 20.7	4.612
17	3 34 16.05	2.0803	15 5 40.7	8.888	17	5 15 1.97	2.1189	20 30 54.5	4.513
18	3 36 20.89	2.0810	15 14 31.6	8.807	18	5 17 9.13	2.1196	20 35 22.3	4.414
19	3 38 25.77	2.0817	15 23 17.6	8.725	19	5 19 16.32	2.1202	20 39 44.2	4.315
20	3 40 30.69	2.0822	15 31 58.6	8.642	20	5 21 23.56	2.1210	20 44 0.1	4.215
21	3 42 35.64	2.0829	15 40 34.7	8.561	21	5 23 30.84	2.1217	20 48 10.0	4.114
22	3 44 40.64	2.0837	15 49 5.9	8.478	22	5 25 38.16	2.1222	20 52 13.8	4.013
23	3 46 45.69	2.0845	N. 15 57 32.1	8.395	23	5 27 45.51	2.1229	N. 20 56 11.6	3.913
24	3 48 50.78	2.0852				5 29 52.91	2.1236		
THURSDAY 26.					SATURDAY 28.				
0	3 50 55.91	2.0859	N. 16 5 53.3	8.311	0	5 32 0.34	2.1242	N. 21 0 3.4	3.812
1	3 53 1.09	2.0867	16 14 9.4	8.227	1	5 34 7.81	2.1247	21 3 49.1	3.712
2	3 55 6.31	2.0875	16 22 20.5	8.142	2	5 36 15.31	2.1253	21 7 28.8	3.611
3	3 57 11.59	2.0883	16 30 26.4	8.056	3	5 38 22.85	2.1259	21 11 2.4	3.509
4	3 59 16.91	2.0890	16 38 27.2	7.970	4	5 40 30.42	2.1264	21 14 29.9	3.407
5	4 1 22.27	2.0898	16 46 22.8	7.883	5	5 42 38.02	2.1269	21 17 51.3	3.306
6	4 3 27.69	2.0907	16 54 13.2	7.797	6	5 44 45.65	2.1274	21 21 6.6	3.204
7	4 5 33.15	2.0915	17 1 58.4	7.710	7	5 46 53.31	2.1279	21 24 15.8	3.102
8	4 7 38.67	2.0923	17 9 38.4	7.622	8	5 49 1.00	2.1284	21 27 18.9	3.000
9	4 9 44.23	2.0932	17 17 13.1	7.534	9	5 51 8.72	2.1288	21 30 15.8	2.897
10	4 11 49.85	2.0940	17 24 42.5	7.445	10	5 53 16.46	2.1292	21 33 6.6	2.794
11	4 13 55.51	2.0948	17 32 6.5	7.356	11	5 55 24.23	2.1297	21 35 51.2	2.692
12	4 16 1.23	2.0957	17 39 25.2	7.267	12	5 57 32.02	2.1300	21 38 29.6	2.589
13	4 18 7.00	2.0966	17 46 38.5	7.177	13	5 59 39.83	2.1304	21 41 1.9	2.487
14	4 20 12.82	2.0974	17 53 46.4	7.087	14	6 1 47.67	2.1307	21 43 28.0	2.383
15	4 22 18.69	2.0982	18 0 48.9	6.996	15	6 3 55.52	2.1310	21 45 47.9	2.280
16	4 24 24.61	2.0991	18 7 45.9	6.905	16	6 6 3.39	2.1313	21 48 1.6	2.177
17	4 26 30.58	2.1000	18 14 37.5	6.813	17	6 8 11.28	2.1316	21 50 9.1	2.073
18	4 28 36.61	2.1009	18 21 23.5	6.721	18	6 10 19.18	2.1317	21 52 10.4	1.970
19	4 30 42.69	2.1017	18 28 4.0	6.629	19	6 12 27.09	2.1320	21 54 5.5	1.867
20	4 32 48.82	2.1026	18 34 39.0	6.537	20	6 14 35.02	2.1322	21 55 54.4	1.763
21	4 34 55.00	2.1034	18 41 8.4	6.443	21	6 16 42.96	2.1324	21 57 37.1	1.659
22	4 37 1.23	2.1042	18 47 32.2	6.350	22	6 18 50.91	2.1326	21 59 13.5	1.555
23	4 39 7.51	2.1052	18 53 50.4	6.256	23	6 20 58.87	2.1327	22 0 43.7	1.452
24	4 41 13.85	2.1061	N. 19 0 2.9	6.162	24	6 23 6.83	2.1327	N. 22 2 7.7	1.347

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 29.					TUESDAY, OCTOBER 1.				
0	h m s		° ' "	"	0	h m s		° ' "	"
1	6 23 6.83	2.1327	N.22 2 7.7	1.347	1	8 5 7.08	2.1080	N.21 7 35.8	3.581
2	6 25 14.80	2.1328	22 3 25.4	1.243					
3	6 27 22.77	2.1329	22 4 36.9	1.140					
4	6 29 30.75	2.1329	22 5 42.2	1.037					
5	6 31 38.72	2.1329	22 6 41.3	0.932					
6	6 33 46.70	2.1329	22 7 34.1	0.827					
7	6 35 54.67	2.1328	22 8 20.6	0.723					
8	6 38 2.64	2.1327	22 9 0.9	0.620					
9	6 40 10.60	2.1326	22 9 35.0	0.516					
10	6 42 18.55	2.1325	22 10 2.8	0.411					
11	6 44 26.50	2.1324	22 10 24.3	0.307					
12	6 46 34.44	2.1322	22 10 39.6	0.202					
13	6 48 42.36	2.1319	22 10 48.6	+0.098					
14	6 50 50.27	2.1317	22 10 51.4	-0.005					
15	6 52 58.17	2.1315	22 10 48.0	0.109					
16	6 55 6.05	2.1312	22 10 38.3	0.213					
17	6 57 13.91	2.1309	22 10 22.4	0.317					
18	6 59 21.76	2.1306	22 10 0.3	0.421					
19	7 1 29.58	2.1302	22 9 31.9	0.525					
20	7 3 37.38	2.1297	22 8 57.3	0.628					
21	7 5 45.15	2.1293	22 8 16.5	0.732					
22	7 7 52.90	2.1290	22 7 29.5	0.836					
23	7 10 0.63	2.1285	22 6 36.2	0.939					
24	7 12 8.32	2.1279	N.22 5 36.8	1.043					
MONDAY 30.									
0	7 14 15.98	2.1274	N.22 4 31.1	1.147					
1	7 16 23.61	2.1269	22 3 19.2	1.249					
2	7 18 31.21	2.1263	22 2 1.2	1.352					
3	7 20 38.77	2.1257	22 0 36.9	1.456					
4	7 22 46.30	2.1252	21 59 6.5	1.558					
5	7 24 53.79	2.1245	21 57 29.9	1.661					
6	7 27 1.24	2.1238	21 55 47.2	1.763					
7	7 29 8.65	2.1231	21 53 58.3	1.866					
8	7 31 16.01	2.1223	21 52 3.3	1.967					
9	7 33 23.33	2.1217	21 50 2.2	2.070					
10	7 35 30.61	2.1209	21 47 54.9	2.172					
11	7 37 37.84	2.1202	21 45 41.5	2.274					
12	7 39 45.03	2.1194	21 43 22.0	2.376					
13	7 41 52.17	2.1185	21 40 56.4	2.477					
14	7 43 59.25	2.1177	21 38 24.7	2.578					
15	7 46 6.29	2.1168	21 35 47.0	2.679					
16	7 48 13.27	2.1159	21 33 3.2	2.781					
17	7 50 20.20	2.1150	21 30 13.3	2.882					
18	7 52 27.07	2.1141	21 27 17.4	2.982					
19	7 54 33.89	2.1132	21 24 15.4	3.082					
20	7 56 40.65	2.1122	21 21 7.5	3.182					
21	7 58 47.35	2.1112	21 17 53.5	3.282					
22	8 0 53.99	2.1102	21 14 33.6	3.382					
23	8 3 0.57	2.1091	21 11 7.7	3.482					
24	8 5 7.08	2.1080	N.21 7 35.8	3.581					

PHASES OF THE MOON.				
		d	h	m
●	New Moon . . . . .	Sept. 7	9	4.0
☾	First Quarter . . . . .	14	15	40.1
☾	Full Moon . . . . .	21	9	33.7
☾	Last Quarter . . . . .	28	23	37.1
		d	h	
☾	Apogee . . . . .	Sept. 2	6.8	
☾	Perigee . . . . .	18	3.2	
☾	Apogee . . . . .	30	1.0	

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	$\alpha$ Pegasi W.	95 35 34	3456	96 56 47	3461	98 17 55	3466	99 38 57	3472
	SATURN W.	91 58 13	3039	93 27 37	3042	94 56 57	3045	96 26 14	3047
	$\alpha$ Arietis W.	52 11 57	3304	53 36 4	3298	55 0 18	3292	56 24 39	3287
	Aldebaran W.	19 5 49	3082	20 34 21	3083	22 2 51	3084	23 31 20	3084
	JUPITER E.	35 31 39	3137	34 4 15	3140	32 36 54	3143	31 9 36	3145
	SUN E.	70 32 45	3443	69 11 18	3446	67 49 54	3450	66 28 34	3452
2	SATURN W.	103 52 13	3051	105 21 23	3050	106 50 34	3049	108 19 46	3047
	$\alpha$ Arietis W.	63 27 58	3260	64 52 56	3256	66 17 59	3251	67 43 8	3246
	Aldebaran W.	30 53 47	3082	32 22 18	3081	33 50 51	3079	35 19 26	3078
	JUPITER E.	23 53 36	3149	22 26 26	3149	20 59 16	3148	19 32 5	3147
	SUN E.	59 42 26	3459	58 21 16	3458	57 0 5	3457	55 38 54	3456
3	$\alpha$ Arietis W.	74 50 27	3219	76 16 14	3214	77 42 7	3208	79 8 7	3202
	Aldebaran W.	42 43 1	3064	44 11 55	3060	45 40 54	3056	47 9 57	3052
	SUN E.	48 52 34	3447	47 31 11	3444	46 9 45	3441	44 48 15	3438
4	$\alpha$ Arietis W.	86 19 51	3173	87 46 33	3166	89 13 23	3159	90 40 21	3153
	Aldebaran W.	54 36 44	3026	56 6 25	3020	57 36 13	3014	59 6 9	3007
	SUN E.	37 59 43	3418	36 37 46	3414	35 15 45	3409	33 53 39	3405
10	SUN W.	31 34 58	2993	33 5 19	2982	34 35 54	2970	36 6 44	2959
	MARS E.	86 13 32	2763	84 38 15	2755	83 2 48	2747	81 27 10	2739
	$\alpha$ Aquilæ E.	98 26 17	3257	97 1 15	3243	95 35 57	3231	94 10 25	3220
11	SUN W.	43 44 22	2906	45 16 33	2896	46 48 57	2886	48 21 33	2876
	MARS E.	73 26 17	2698	71 49 34	2690	70 12 41	2682	68 35 37	2674
	$\alpha$ Aquilæ E.	86 59 53	3180	85 33 20	3174	84 6 40	3170	82 39 55	3167
12	SUN W.	56 7 38	2830	57 41 27	2821	59 15 28	2811	60 49 41	2802
	MARS E.	60 27 41	2636	58 49 35	2629	57 11 19	2621	55 32 53	2614
	$\alpha$ Aquilæ E.	75 25 36	3167	73 58 47	3170	72 32 2	3175	71 5 23	3182
	Fomalhaut E.	108 28 2	2722	106 51 52	2710	105 15 26	2699	103 38 44	2688
13	SUN W.	68 43 40	2759	70 19 2	2750	71 54 36	2741	73 30 22	2732
	MARS E.	47 18 19	2580	45 38 56	2574	43 59 25	2567	42 19 45	2561
	$\alpha$ Aquilæ E.	63 54 48	3241	62 29 27	3239	61 4 27	3230	59 39 52	3204
	Fomalhaut E.	95 31 41	2638	93 53 37	2629	92 15 22	2621	90 36 55	2612
	$\alpha$ Pegasi E.	111 1 37	2569	109 28 38	2553	107 55 19	2537	106 21 39	2522
	SATURN E.	116 16 35	2404	114 33 6	2396	112 49 26	2388	111 5 34	2380
14	SUN W.	81 31 59	2690	83 8 52	2682	84 45 55	2674	86 23 10	2666
	$\alpha$ Aquilæ E.	52 45 5	3476	51 24 14	3525	50 4 17	3579	48 45 20	3640
	Fomalhaut E.	82 22 4	2578	80 42 39	2573	79 3 7	2568	77 23 28	2563
	$\alpha$ Pegasi E.	98 28 42	2757	96 53 18	2747	95 17 40	2736	93 41 48	2728
	SATURN E.	102 23 25	2341	100 38 25	2334	98 53 15	2326	97 7 53	2319
15	SUN W.	94 32 5	2627	96 10 23	2620	97 48 51	2613	99 27 28	2606
	Fomalhaut E.	69 3 54	2549	67 23 49	2549	65 43 44	2550	64 3 40	2551
	$\alpha$ Pegasi E.	85 39 52	2693	84 3 3	2689	82 26 8	2685	80 49 8	2683
	SATURN E.	88 18 23	2282	86 31 57	2275	84 45 21	2268	82 58 34	2262



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
1	<i>α</i> Pegasi W.	100 59 53	3478	102 20 42	3483	103 41 25	3489	105 2 1	3495
	SATURN W.	97 55 29	3048	99 24 42	3050	100 53 53	3051	102 23 3	3051
	<i>α</i> Arietis W.	57 49 7	3282	59 13 40	3276	60 38 20	3270	62 3 6	3265
	Aldebaran W.	24 59 49	3084	26 28 18	3084	27 56 47	3083	29 25 17	3083
	JUPITER E.	29 42 21	3147	28 15 8	3148	26 47 57	3148	25 20 46	3149
	SUN E.	65 7 17	3454	63 46 2	3456	62 24 49	3457	61 3 37	3458
2	SATURN W.	109 49 0	3046	111 18 16	3044	112 47 34	3042	114 16 55	3039
	<i>α</i> Arietis W.	69 8 24	3241	70 33 45	3235	71 59 13	3230	73 24 47	3225
	Aldebaran W.	36 48 3	3076	38 16 42	3073	39 45 25	3070	41 14 11	3067
	JUPITER E.	18 4 52	3146	16 37 38	3144	15 10 22	3142	13 43 4	3139
	SUN E.	54 17 41	3455	52 56 27	3454	51 35 12	3452	50 13 54	3450
3	<i>α</i> Arietis W.	80 34 14	3196	82 0 28	3190	83 26 48	3184	84 53 16	3178
	Aldebaran W.	48 39 6	3047	50 8 21	3042	51 37 42	3036	53 7 10	3031
	SUN E.	43 26 41	3434	42 5 3	3430	40 43 21	3426	39 21 34	3422
4	<i>α</i> Arietis W.	92 7 26	3147	93 34 38	3141	95 1 58	3134	96 29 26	3128
	Aldebaran W.	60 36 14	3000	62 6 27	2993	63 36 48	2986	65 7 18	2979
	SUN E.	32 31 28	3400	31 9 12	3396	29 46 51	3393	28 24 26	3389
10	SUN W.	37 37 49	2948	39 9 7	2938	40 40 38	2927	42 12 23	2916
	MARS E.	79 51 22	2730	78 15 22	2722	76 39 11	2713	75 2 49	2706
	<i>α</i> Aquilæ E.	92 44 40	3210	91 18 43	3202	89 52 36	3194	88 26 19	3186
11	SUN W.	49 54 22	2867	51 27 23	2858	53 0 36	2848	54 34 1	2839
	MARS E.	66 58 22	2666	65 20 57	2659	63 43 22	2651	62 5 37	2643
	<i>α</i> Aquilæ E.	81 13 6	3164	79 46 14	3163	78 19 21	3163	76 52 28	3164
12	SUN W.	62 24 6	2794	63 58 42	2785	65 33 30	2776	67 8 29	2767
	MARS E.	53 54 17	2607	52 15 31	2600	50 36 37	2593	48 57 33	2586
	<i>α</i> Aquilæ E.	69 38 53	3190	68 12 32	3189	66 46 22	3181	65 20 27	3175
	Fomalhaut E.	102 1 48	2677	100 24 37	2666	98 47 12	2656	97 9 33	2647
13	SUN W.	75 6 19	2724	76 42 27	2716	78 18 46	2707	79 55 17	2698
	MARS E.	40 39 56	2556	39 0 0	2550	37 19 56	2545	35 39 46	2540
	<i>α</i> Aquilæ E.	58 15 45	3331	56 52 9	3361	55 29 7	3394	54 6 44	3433
	Fomalhaut E.	88 58 16	2604	87 19 27	2598	85 40 29	2591	84 1 21	2584
	<i>α</i> Pegasi E.	104 47 40	2808	103 13 22	2793	101 38 45	2781	100 3 51	2769
	SATURN E.	109 21 31	2372	107 37 16	2365	105 52 51	2357	104 8 14	2349
14	SUN W.	88 0 36	2658	89 38 12	2650	91 15 59	2642	92 53 57	2635
	<i>α</i> Aquilæ E.	47 27 29	3709	46 10 52	3788	44 55 37	3875	43 41 52	3971
	Fomalhaut E.	75 43 42	2559	74 3 51	2556	72 23 55	2553	70 43 56	2551
	<i>α</i> Pegasi E.	92 5 45	2720	90 29 31	2712	88 53 7	2705	87 16 34	2699
	SATURN E.	95 22 21	2311	93 36 38	2304	91 50 44	2296	90 4 39	2289
15	SUN W.	101 6 16	2599	102 45 13	2592	104 24 19	2585	106 3 34	2579
	Fomalhaut E.	62 23 37	2553	60 43 37	2556	59 3 42	2560	57 23 53	2566
	<i>α</i> Pegasi E.	79 12 5	2681	77 34 59	2680	75 57 52	2680	74 20 45	2681
	SATURN E.	81 11 38	2255	79 24 32	2249	77 37 17	2242	75 49 52	2236

GREENWICH MEAN TIME.											
LUNAR DISTANCES.											
Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.	
16	SUN	W.	107 42 58	2573	109 22 30	2567	111 2 10	2561	112 41 58	2556	
	Antares	W.	32 10 10	2398	33 53 48	2379	35 37 53	2392	37 22 22	2347	
	Fomalhaut	E.	55 44 12	2574	54 4 42	2583	52 25 24	2594	50 46 21	2608	
	α Pegasi	E.	72 43 40	2683	71 6 37	2687	69 29 39	2692	67 52 48	2698	
	SATURN	E.	74 2 18	2230	72 14 35	2225	70 26 44	2219	68 38 45	2214	
	α Arietis	E.	115 34 11	2432	113 51 22	2421	112 8 17	2411	110 24 57	2401	
17	SUN	W.	121 2 38	2535	122 43 3	2532	124 23 32	2529	126 4 5	2526	
	Antares	W.	46 9 36	2291	47 55 48	2283	49 42 13	2275	51 28 49	2268	
	SATURN	E.	59 36 59	2191	57 48 18	2188	55 59 32	2184	54 10 41	2181	
	α Pegasi	E.	59 51 23	2756	58 15 57	2774	56 40 54	2794	55 6 18	2817	
	α Arietis	E.	101 45 18	2364	100 0 52	2359	98 16 18	2354	96 31 37	2350	
	18	Antares	W.	60 23 56	2245	62 11 16	2242	63 58 41	2240	65 46 9	2239
MARS		W.	22 2 7	2410	23 45 27	2398	25 29 4	2389	27 12 54	2382	
SATURN		E.	45 5 30	2172	43 16 21	2172	41 27 11	2172	39 38 1	2172	
α Arietis		E.	87 46 58	2338	86 1 54	2337	84 16 49	2338	82 31 45	2339	
Aldebaran		E.	119 16 39	2194	117 28 2	2192	115 39 23	2191	113 50 42	2191	
19		Antares	W.	74 43 47	2239	76 31 17	2241	78 18 43	2243	80 6 6	2246
	MARS	W.	35 54 2	2366	37 38 26	2366	39 22 50	2367	41 7 14	2368	
	SATURN	E.	30 32 33	2182	28 43 38	2186	26 54 49	2190	25 6 7	2196	
	α Arietis	E.	73 47 11	2356	72 2 33	2362	70 18 3	2368	68 33 43	2375	
	Aldebaran	E.	104 47 27	2196	102 58 54	2199	101 10 25	2202	99 22 0	2205	
	20	Antares	W.	89 1 43	2269	90 48 28	2275	92 35 4	2282	94 21 29	2289
MARS		W.	49 48 14	2387	51 32 8	2392	53 15 54	2398	54 59 31	2405	
α Aquilæ		W.	48 38 35	2464	49 59 39	2407	51 21 48	2406	52 44 55	2411	
α Arietis		E.	59 55 15	2430	58 12 22	2444	56 29 50	2460	54 47 40	2477	
Aldebaran		E.	90 21 26	2229	88 33 42	2236	86 46 8	2243	84 58 44	2250	
21		Antares	W.	103 10 40	2335	104 55 49	2346	106 40 43	2357	108 25 20	2368
	MARS	W.	63 34 55	2448	65 17 22	2458	66 59 35	2468	68 41 34	2479	
	α Aquilæ	W.	59 51 39	2458	61 18 38	2468	62 46 2	2478	64 13 45	2489	
	α Arietis	E.	46 23 35	2588	44 44 24	2618	43 5 53	2649	41 28 5	2685	
	Aldebaran	E.	76 4 36	2293	74 18 26	2303	72 32 30	2313	70 46 49	2324	
	Pollux	E.	120 6 59	2328	118 21 40	2337	116 36 34	2346	114 51 41	2355	
22	MARS	W.	77 7 26	2540	78 47 44	2553	80 27 44	2566	82 7 26	2580	
	α Aquilæ	W.	71 35 12	2680	73 3 46	2680	74 32 20	2682	76 0 52	2685	
	Aldebaran	E.	62 2 32	2383	60 18 33	2396	58 34 53	2410	56 51 32	2423	
	Pollux	E.	106 10 55	2410	104 27 35	2422	102 44 32	2435	101 1 48	2448	
	23	MARS	W.	90 20 57	2654	91 58 38	2669	93 35 59	2685	95 12 59	2701
		α Aquilæ	W.	83 21 53	2724	84 49 34	2736	86 17 0	2748	87 44 11	2762
Fomalhaut		W.	48 38 38	2869	50 11 37	2867	51 44 38	2866	53 17 41	2867	
α Pegasi		W.	36 39 20	2766	37 54 58	2688	39 11 58	2620	40 30 11	2561	
SATURN		W.	26 24 17	2478	28 6 1	2492	29 47 25	2506	31 28 30	2520	
Aldebaran		E.	48 19 43	2495	46 38 23	2510	44 57 24	2525	43 16 46	2541	
24	Pollux	E.	92 32 53	2519	90 52 6	2533	89 11 39	2548	87 31 32	2563	
	MARS	W.	103 12 37	2782	104 47 28	2799	106 21 57	2815	107 56 5	2831	

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
16	SUN W.	114 21 53	2551	116 1 55	2547	117 42 4	2543	119 22 18	2539
	Antares W.	39 7 13	2334	40 52 23	2322	42 37 52	2310	44 23 37	2300
	Fomalhaut E.	49 7 37	2624	47 29 15	2642	45 51 17	2664	44 13 48	2690
	α Pegasi E.	66 16 6	2706	64 39 34	2715	63 3 14	2726	61 27 9	2740
	SATURN E.	66 50 38	2209	65 2 24	2204	63 14 2	2200	61 25 34	2195
	α Arietis E.	108 41 24	2393	106 57 39	2385	105 13 42	2378	103 29 35	2371
17	SUN W.	127 44 42	2524	129 25 22	2523	131 6 3	2522	132 46 46	2521
	Antares W.	53 15 35	2262	55 2 30	2258	56 49 32	2253	58 36 41	2249
	SATURN E.	52 21 45	2179	50 32 46	2177	48 43 43	2175	46 54 38	2173
	α Pegasi E.	53 32 12	2844	51 58 41	2874	50 25 49	2908	48 53 41	2948
	α Arietis E.	94 46 50	2346	93 1 58	2343	91 17 1	2341	89 32 1	2339
18	Antares W.	67 33 39	2238	69 21 11	2237	71 8 43	2237	72 56 15	2238
	MARS W.	28 56 54	2376	30 41 3	2371	32 25 19	2368	34 9 39	2366
	SATURN E.	37 48 51	2173	35 59 42	2174	34 10 36	2176	32 21 33	2179
	α Arietis E.	80 46 43	2341	79 1 43	2344	77 16 47	2347	75 31 56	2351
	Aldebaran E.	112 2 1	2191	110 13 20	2192	108 24 41	2193	106 36 3	2194
19	Antares W.	81 53 26	2249	83 40 40	2253	85 27 48	2258	87 14 49	2263
	MARS W.	42 51 35	2370	44 35 52	2373	46 20 5	2377	48 4 13	2382
	SATURN E.	23 17 34	2203	21 29 11	2210	19 40 59	2219	17 53 0	2230
	α Arietis E.	66 49 33	2384	65 5 36	2394	63 21 53	2405	61 38 26	2417
	Aldebaran E.	97 33 40	2209	95 45 26	2214	93 57 19	2218	92 9 19	2223
20	Antares W.	96 7 44	2297	97 53 47	2306	99 39 38	2315	101 25 16	2325
	MARS W.	56 42 59	2413	58 26 16	2421	60 9 21	2429	61 52 14	2438
	α Aquilæ W.	54 8 54	2371	55 33 39	2376	56 59 5	2386	58 25 7	2381
	α Arietis E.	53 5 54	2496	51 24 34	2516	49 43 43	2538	48 3 22	2562
	Aldebaran E.	83 11 30	2258	81 24 28	2266	79 37 38	2274	77 51 0	2283
21	Antares W.	110 9 41	2380	111 53 44	2392	113 37 30	2405	115 20 57	2419
	MARS W.	70 23 17	2490	72 4 44	2502	73 45 55	2514	75 26 49	2527
	α Aquilæ W.	65 41 42	3100	67 9 52	3091	68 38 12	3085	70 6 40	3082
	α Arietis E.	39 51 5	2724	38 14 57	2767	36 39 46	2815	35 5 37	2867
	Aldebaran E.	69 1 24	2335	67 16 15	2347	65 31 24	2359	63 46 49	2371
	Pollux E.	113 7 1	2365	111 22 36	2376	109 38 26	2387	107 54 32	2398
22	MARS W.	83 46 48	2595	85 25 50	2610	87 4 32	2624	88 42 55	2639
	α Aquilæ W.	77 29 20	3090	78 57 42	3097	80 25 55	3105	81 53 59	3114
	Aldebaran E.	55 8 30	2437	53 25 48	2451	51 43 26	2465	50 1 24	2480
	Pollux E.	99 19 22	2462	97 37 15	2476	95 55 28	2490	94 14 1	2504
23	MARS W.	96 49 37	2717	98 25 54	2733	100 1 50	2750	101 37 24	2766
	α Aquilæ W.	89 11 7	3177	90 37 44	3193	92 4 2	3209	93 30 1	3226
	Fomalhaut W.	54 50 44	2868	56 23 45	2871	57 56 41	2875	59 29 32	2880
	α Pegasi W.	41 49 28	3511	43 9 40	3468	44 30 40	3431	45 52 21	3400
	SATURN W.	33 9 16	2534	34 49 41	2548	36 29 47	2563	38 9 33	2578
	Aldebaran E.	41 36 30	2557	39 56 36	2572	38 17 3	2588	36 37 52	2604
	Pollux E.	85 51 46	2579	84 12 22	2594	82 33 19	2610	80 54 37	2625
24	MARS W.	109 29 53	2848	111 3 19	2864	112 36 24	2880	114 9 8	2896

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
24	<i>a</i> Aquilæ W.	94 55 39	3245	96 20 55	3265	97 45 47	3286	99 10 15	3307
	Fomalhaut W.	61 2 16	2887	62 34 51	2894	64 7 17	2902	65 39 33	2912
	<i>a</i> Pegasi W.	47 14 37	3374	48 37 23	3352	50 0 34	3334	51 24 6	3318
	SATURN W.	39 48 59	2593	41 28 4	2608	43 6 48	2623	44 45 12	2638
	Aldebaran E.	34 59 2	2621	33 20 35	2638	31 42 31	2653	30 4 48	2670
	Pollux E.	79 16 16	2641	77 38 17	2657	76 0 39	2673	74 23 22	2689
	JUPITER E.	93 45 40	2669	92 8 18	2685	90 31 18	2701	88 54 39	2716
25	Fomalhaut W.	73 17 51	2963	74 48 50	2974	76 19 35	2986	77 50 5	2998
	<i>a</i> Pegasi W.	58 25 15	3279	59 49 51	3276	61 14 30	3275	62 39 11	3275
	SATURN W.	52 52 5	2713	54 28 28	2728	56 4 31	2742	57 40 15	2756
	Pollux E.	66 22 20	2769	64 47 11	2784	63 12 22	2800	61 37 54	2815
	JUPITER E.	80 56 32	2793	79 21 55	2808	77 47 38	2823	76 13 40	2837
	Regulus E.	102 8 11	2739	100 32 24	2753	98 56 55	2768	97 21 46	2783
26	Fomalhaut W.	85 18 51	3060	86 47 50	3072	88 16 34	3084	89 45 3	3096
	<i>a</i> Pegasi W.	69 42 8	3290	71 6 31	3295	72 30 48	3300	73 54 59	3306
	SATURN W.	65 34 18	2825	67 8 13	2838	68 41 52	2851	70 15 14	2863
	<i>a</i> Arietis W.	26 32 19	3663	27 49 46	3599	29 8 21	3546	30 27 56	3498
	Pollux E.	53 50 35	2892	52 18 6	2907	50 45 57	2922	49 14 6	2937
	JUPITER E.	68 28 29	2908	66 56 20	2922	65 24 29	2934	63 52 54	2946
	Regulus E.	89 30 41	2852	87 57 21	2866	86 24 19	2879	84 51 33	2891
	SUN E.	123 5 29	3225	121 39 50	3239	120 14 28	3253	118 49 22	3267
27	Fomalhaut W.	97 3 41	3158	98 30 40	3170	99 57 25	3182	101 23 56	3194
	<i>a</i> Pegasi W.	80 54 1	3341	82 17 25	3349	83 40 39	3357	85 3 45	3364
	SATURN W.	77 58 13	2920	79 30 6	2930	81 1 46	2940	82 33 14	2950
	<i>a</i> Arietis W.	37 16 24	3357	38 39 30	3340	40 2 55	3327	41 26 35	3316
	Pollux E.	41 39 31	3010	40 9 31	3025	38 39 49	3040	37 10 25	3055
	JUPITER E.	56 18 47	3005	54 48 40	3016	53 18 47	3026	51 49 6	3035
	Regulus E.	77 11 35	2949	75 40 18	2959	74 9 15	2969	72 38 24	2979
	SUN E.	111 47 36	3327	110 23 57	3338	109 0 30	3349	107 37 15	3359
28	Fomalhaut W.	108 32 57	3253	109 58 4	3264	111 22 58	3276	112 47 38	3287
	<i>a</i> Pegasi W.	91 57 1	3404	93 19 13	3413	94 41 15	3421	96 3 8	3429
	SATURN W.	90 7 43	2991	91 38 7	2998	93 8 22	3004	94 38 29	3010
	<i>a</i> Arietis W.	48 27 41	3280	49 52 16	3275	51 16 57	3271	52 41 43	3268
	JUPITER E.	44 23 30	3078	42 54 53	3085	41 26 25	3091	39 58 4	3097
	Regulus E.	65 7 1	3021	63 37 15	3028	62 7 37	3035	60 38 8	3041
	SUN E.	100 43 48	3404	99 21 36	3411	97 59 33	3418	96 37 37	3425
29	SATURN W.	102 7 24	3034	103 36 55	3037	105 6 22	3039	106 35 46	3041
	<i>a</i> Arietis W.	59 46 22	3255	61 11 26	3252	62 36 34	3249	64 1 45	3247
	Aldebaran W.	27 7 37	3071	28 36 22	3073	30 5 4	3074	31 33 45	3076
	JUPITER E.	32 38 3	3121	31 10 19	3124	29 42 39	3127	28 15 3	3130
	Regulus E.	53 12 25	3065	51 43 33	3069	50 14 45	3072	48 46 1	3074
	SUN E.	89 49 39	3450	88 28 20	3454	87 7 4	3456	85 45 51	3459
30	<i>a</i> Arietis W.	71 8 25	3233	72 33 55	3229	73 59 30	3225	75 25 9	3221
	Aldebaran W.	38 56 54	3076	40 25 32	3075	41 54 12	3073	43 22 54	3071
	Regulus E.	41 22 56	3081	39 54 23	3080	38 25 49	3080	36 57 15	3079
	SUN E.	79 0 19	3461	77 39 15	3463	76 18 10	3462	74 57 3	3461

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
24	α Aquilæ W.	100 34 19	3329	101 57 57	3353	103 21 7	3378	104 43 49	3402
	Fomalhaut W.	67 11 38	2922	68 43 30	2931	70 15 10	2941	71 46 37	2952
	α Pegasi W.	52 47 57	3306	54 12 2	3296	55 36 18	3288	57 0 43	3282
	SATURN W.	46 23 15	2653	48 0 58	2669	49 38 20	2684	51 15 22	2698
	Aldebaran E.	28 27 28	2687	26 50 31	2704	25 13 56	2721	23 37 44	2738
	Pollux E.	72 46 27	2705	71 9 54	2721	69 33 42	2737	67 57 51	2753
	JUPITER E.	87 18 21	2732	85 42 23	2747	84 6 46	2763	82 31 29	2778
25	Fomalhaut W.	79 20 21	3010	80 50 21	3022	82 20 6	3034	83 49 36	3047
	α Pegasi W.	64 3 52	3276	65 28 31	3279	66 53 7	3282	68 17 40	3286
	SATURN W.	59 15 40	2770	60 50 47	2784	62 25 35	2798	64 0 5	2811
	Pollux E.	60 3 46	2831	58 29 59	2846	56 56 31	2862	55 23 23	2877
	JUPITER E.	74 40 0	2852	73 6 39	2867	71 33 38	2881	70 0 55	2894
	Regulus E.	95 46 56	2798	94 12 25	2812	92 38 13	2825	91 4 18	2839
26	Fomalhaut W.	91 13 17	3109	92 41 16	3122	94 8 59	3134	95 36 27	3146
	α Pegasi W.	75 19 3	3313	76 42 59	3319	78 6 48	3326	79 30 29	3334
	SATURN W.	71 48 20	2875	73 21 10	2887	74 53 45	2898	76 26 6	2909
	α Arietis W.	31 48 23	3458	33 9 34	3425	34 31 22	3399	35 53 40	3376
	Pollux E.	47 42 34	2952	46 11 21	2966	44 40 26	2981	43 9 49	2996
	JUPITER E.	62 21 34	2959	60 50 30	2971	59 19 42	2983	57 49 8	2994
	Regulus E.	83 19 3	2904	81 46 49	2916	80 14 50	2927	78 43 5	2938
	SUN E.	117 24 32	3280	115 59 57	3292	114 35 36	3304	113 11 29	3316
27	Fomalhaut W.	102 50 12	3206	104 16 14	3218	105 42 2	3230	107 7 36	3241
	α Pegasi W.	86 26 43	3372	87 49 31	3380	89 12 10	3388	90 34 40	3396
	SATURN W.	84 4 30	2959	85 35 34	2968	87 6 27	2976	88 37 10	2984
	α Arietis W.	42 50 29	3306	44 14 34	3298	45 38 48	3291	47 3 11	3285
	Pollux E.	35 41 20	3070	34 12 33	3086	32 44 6	3102	31 15 59	3119
	JUPITER E.	50 19 37	3044	48 50 20	3053	47 21 13	3062	45 52 17	3070
	Regulus E.	71 7 45	2988	69 37 18	2997	68 7 2	3006	66 36 57	3014
	SUN E.	106 14 12	3369	104 51 21	3379	103 28 40	3387	102 6 9	3396
28	Fomalhaut W.	114 12 5	3298	115 36 19	3310	117 0 19	3322	118 24 5	3333
	α Pegasi W.	97 24 52	3438	98 46 26	3446	100 7 51	3454	101 29 7	3463
	SATURN W.	96 8 29	3016	97 38 22	3021	99 8 8	3026	100 37 49	3030
	α Arietis W.	54 6 32	3265	55 31 25	3262	56 56 21	3259	58 21 20	3257
	JUPITER E.	38 29 51	3103	37 1 45	3108	35 33 46	3113	34 5 52	3117
	Regulus E.	59 8 46	3047	57 39 31	3052	56 10 24	3057	54 41 22	3061
	SUN E.	95 15 49	3431	93 54 8	3437	92 32 33	3441	91 11 3	3446
29	SATURN W.	108 5 8	3043	109 34 27	3044	111 3 45	3045	112 33 1	3046
	α Arietis W.	65 26 59	3245	66 52 15	3242	68 17 35	3239	69 42 58	3236
	Aldebaran W.	33 2 24	3077	34 31 2	3078	35 59 39	3078	37 28 16	3077
	JUPITER E.	26 47 30	3132	25 19 59	3133	23 52 30	3135	22 25 3	3136
	Regulus E.	47 17 20	3076	45 48 42	3078	44 20 5	3079	42 51 30	3080
	SUN E.	84 24 41	3462	83 3 34	3463	81 42 28	3463	80 21 23	3464
30	α Arietis W.	76 50 52	3218	78 16 40	3214	79 42 33	3209	81 8 32	3204
	Aldebaran W.	44 51 39	3069	46 20 26	3066	47 49 17	3063	49 18 12	3059
	Regulus E.	35 28 40	3078	34 0 3	3077	32 31 25	3073	31 2 44	3073
	SUN E.	73 35 55	3458	72 14 44	3456	70 53 31	3453	69 32 14	3450

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ' "	"	' "	s	m s	s
Tues.	1	12 26 14.06	9.045	S. 2 50 11.7	-58.32	16 0.56	64.27	10 0.78	0.809
Wed.	2	12 29 51.27	9.058	3 13 30.4	58.25	16 0.83	64.31	10 20.06	0.797
Thur.	3	12 33 28.80	9.071	3 36 47.2	58.16	16 1.10	64.36	10 39.03	0.784
Frid.	4	12 37 6.65	9.085	4 0 1.6	-58.05	16 1.37	64.41	10 57.68	0.770
Sat.	5	12 40 44.84	9.099	4 23 13.4	57.93	16 1.65	64.46	11 15.99	0.756
SUN.	6	12 44 23.39	9.114	4 46 22.0	57.78	16 1.92	64.51	11 33.95	0.740
Mon.	7	12 48 2.32	9.130	5 9 27.2	-57.64	16 2.20	64.57	11 51.52	0.724
Tues.	8	12 51 41.63	9.147	5 32 28.5	57.46	16 2.48	64.63	12 8.71	0.708
Wed.	9	12 55 21.36	9.164	5 55 25.5	57.28	16 2.76	64.69	12 25.50	0.690
Thur.	10	12 59 1.52	9.182	6 18 18.0	-57.08	16 3.04	64.76	12 41.85	0.672
Frid.	11	13 2 42.11	9.201	6 41 5.3	56.86	16 3.32	64.83	12 57.77	0.654
Sat.	12	13 6 23.15	9.220	7 3 47.2	56.63	16 3.60	64.90	13 13.23	0.635
SUN.	13	13 10 4.65	9.239	7 26 23.3	-56.37	16 3.88	64.98	13 28.24	0.615
Mon.	14	13 13 46.66	9.260	7 48 53.3	56.10	16 4.16	65.05	13 42.75	0.594
Tues.	15	13 17 29.17	9.282	8 11 16.6	55.82	16 4.44	65.13	13 56.75	0.573
Wed.	16	13 21 12.20	9.305	8 33 32.9	-55.52	16 4.72	65.21	14 10.24	0.551
Thur.	17	13 24 55.78	9.329	8 55 41.8	55.21	16 5.00	65.30	14 23.18	0.527
Frid.	18	13 28 39.93	9.353	9 17 43.1	54.89	16 5.28	65.38	14 35.54	0.503
Sat.	19	13 32 24.66	9.378	9 39 36.2	-54.54	16 5.56	65.47	14 47.34	0.479
SUN.	20	13 36 10.00	9.403	10 1 20.9	54.17	16 5.84	65.56	14 58.52	0.453
Mon.	21	13 39 55.98	9.429	10 22 56.7	53.79	16 6.11	65.65	15 9.07	0.426
Tues.	22	13 43 42.59	9.456	10 44 23.3	-53.40	16 6.38	65.74	15 18.98	0.399
Wed.	23	13 47 29.87	9.484	11 5 40.3	53.00	16 6.64	65.84	15 28.23	0.371
Thur.	24	13 51 17.84	9.513	11 26 47.4	52.58	16 6.90	65.94	15 36.80	0.342
Frid.	25	13 55 6.52	9.543	11 47 44.2	-52.14	16 7.16	66.04	15 44.64	0.312
Sat.	26	13 58 55.91	9.573	12 8 30.4	51.69	16 7.42	66.14	15 51.78	0.282
SUN.	27	14 2 46.04	9.604	12 29 5.4	51.22	16 7.68	66.25	15 58.19	0.251
Mon.	28	14 6 36.92	9.636	12 49 28.9	-50.73	16 7.93	66.35	16 3.85	0.220
Tues.	29	14 10 28.57	9.668	13 9 40.6	50.23	16 8.18	66.46	16 8.74	0.188
Wed.	30	14 14 21.00	9.701	13 29 40.1	49.72	16 8.43	66.57	16 12.86	0.155
Thur.	31	14 18 14.22	9.734	13 49 26.8	49.18	16 8.68	66.68	16 16.18	0.122
Frid.	32	14 22 8.23	9.767	S. 14 9 0.2	-48.62	16 8.93	66.79	16 18.72	0.089

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0°.18 from the sidereal time.  
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Tues.	1	12 26 15.56	9.047	S. 2 50 21.4	-58.33	10 0.92	0.809	12 36 16.48
Wed.	2	12 29 52.83	9.060	3 13 40.5	58.26	10 20.20	0.797	12 40 13.03
Thur.	3	12 33 30.41	9.073	3 36 57.6	58.17	10 39.17	0.784	12 44 9.58
Frid.	4	12 37 8.31	9.086	4 0 12.3	-58.06	10 57.82	0.770	12 48 6.13
Sat.	5	12 40 46.55	9.101	4 23 24.3	57.94	11 16.13	0.756	12 52 2.68
SUN.	6	12 44 25.15	9.116	4 46 33.2	57.80	11 34.09	0.740	12 55 59.24
Mon.	7	12 48 4.13	9.132	5 9 38.6	-57.65	11 51.66	0.724	12 59 55.79
Tues.	8	12 51 43.49	9.149	5 32 40.2	57.49	12 8.85	0.708	13 3 52.34
Wed.	9	12 55 23.26	9.166	5 55 37.4	57.30	12 25.64	0.690	13 7 48.90
Thur.	10	12 59 3.46	9.183	6 18 30.1	-57.09	12 41.99	0.672	13 11 45.45
Frid.	11	13 2 44.09	9.200	6 41 17.6	56.87	12 57.91	0.654	13 15 42.00
Sat.	12	13 6 25.18	9.220	7 3 59.7	56.64	13 13.37	0.635	13 19 38.55
SUN.	13	13 10 6.73	9.241	7 26 36.0	-56.38	13 28.38	0.615	13 23 35.11
Mon.	14	13 13 48.78	9.262	7 49 6.1	56.11	13 42.88	0.594	13 27 31.66
Tues.	15	13 17 31.33	9.284	8 11 29.5	55.83	13 56.88	0.573	13 31 28.21
Wed.	16	13 21 14.40	9.307	8 33 46.0	-55.53	14 10.37	0.551	13 35 24.77
Thur.	17	13 24 58.02	9.331	8 55 55.0	55.21	14 23.30	0.527	13 39 21.32
Frid.	18	13 28 42.21	9.355	9 17 56.4	54.88	14 35.66	0.503	13 43 17.87
Sat.	19	13 32 26.98	9.379	9 39 49.6	-54.54	14 47.45	0.479	13 47 14.43
SUN.	20	13 36 12.35	9.404	10 1 34.3	54.17	14 58.63	0.453	13 51 10.98
Mon.	21	13 39 58.36	9.430	10 23 10.2	53.79	15 9.17	0.426	13 55 7.53
Tues.	22	13 43 45.01	9.457	10 44 36.8	-53.41	15 19.08	0.399	13 59 4.09
Wed.	23	13 47 32.32	9.486	11 5 53.9	53.00	15 28.32	0.371	14 3 0.64
Thur.	24	13 51 20.32	9.516	11 27 1.0	52.58	15 36.88	0.342	14 6 57.20
Frid.	25	13 55 9.03	9.546	11 47 57.8	-52.14	15 44.72	0.312	14 10 53.75
Sat.	26	13 58 58.45	9.577	12 8 44.0	51.69	15 51.85	0.282	14 14 50.30
SUN.	27	14 2 48.61	9.607	12 29 19.0	51.22	15 58.25	0.251	14 18 46.86
Mon.	28	14 6 39.51	9.638	12 49 42.4	-50.73	16 3.90	0.220	14 22 43.41
Tues.	29	14 10 31.18	9.669	13 9 54.0	50.23	16 8.78	0.188	14 26 39.96
Wed.	30	14 14 23.63	9.702	13 29 53.4	49.72	16 12.89	0.155	14 30 36.52
Thur.	31	14 18 16.86	9.735	13 49 40.0	49.18	16 16.21	0.122	14 34 33.07
Frid.	32	14 22 10.89	9.768	S. 14 9 13.6	-48.62	16 18.74	0.089	14 38 29.63

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,  
+ 9°.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
		° ' "	' "	"	"			h m s
1	274	187 9 20.6	8 59.9	147.56	— 0.31	0.000 4263	— 50.9	11 21 51.51
2	275	188 8 23.1	8 2.3	147.65	0.19	0.000 3040	51.1	11 17 55.61
3	276	189 7 27.9	7 7.0	147.75	— 0.08	0.000 1812	51.3	11 13 59.70
4	277	190 6 34.9	6 13.9	147.84	+ 0.02	0.000 0579	— 51.5	11 10 3.79
5	278	191 5 44.1	5 23.0	147.93	0.09	9.999 9341	51.7	11 6 7.89
6	279	192 4 55.5	4 34.3	148.02	0.15	9.999 8097	52.0	11 2 11.98
7	280	193 4 9.0	3 47.7	148.10	+ 0.18	9.999 6847	— 52.2	10 58 16.07
8	281	194 3 24.5	3 3.2	148.19	0.16	9.999 5591	52.4	10 54 20.17
9	282	195 2 42.0	2 20.5	148.27	0.13	9.999 4330	52.6	10 50 24.26
10	283	196 2 1.4	1 39.9	148.35	+ 0.07	9.999 3064	— 52.8	10 46 28.35
11	284	197 1 22.7	1 1.0	148.42	— 0.03	9.999 1794	52.9	10 42 32.45
12	285	198 0 45.7	0 24.0	148.50	0.14	9.999 0522	53.0	10 38 36.54
13	286	199 0 10.5	59 48.7	148.57	— 0.26	9.998 9250	— 53.0	10 34 40.63
14	287	199 59 37.1	59 15.2	148.65	0.40	9.998 7979	52.9	10 30 44.72
15	288	200 59 5.4	58 43.4	148.72	0.54	9.998 6710	52.7	10 26 48.82
16	289	201 58 35.4	58 13.3	148.79	— 0.67	9.998 5447	— 52.5	10 22 52.91
17	290	202 58 7.2	57 45.0	148.86	0.77	9.998 4190	52.2	10 18 57.00
18	291	203 57 40.8	57 18.4	148.93	0.85	9.998 2940	51.8	10 15 1.09
19	292	204 57 16.2	56 53.7	149.01	— 0.90	9.998 1701	— 51.4	10 11 5.19
20	293	205 56 53.4	56 30.9	149.09	0.93	9.998 0472	51.0	10 7 9.28
21	294	206 56 32.6	56 10.0	149.18	0.92	9.997 9254	50.5	10 3 13.37
22	295	207 56 13.9	55 51.1	149.26	— 0.88	9.997 8047	— 50.0	9 59 17.46
23	296	208 55 57.2	55 34.3	149.35	0.82	9.997 6853	49.5	9 55 21.56
24	297	209 55 42.5	55 19.6	149.44	0.75	9.997 5670	49.1	9 51 25.65
25	298	210 55 30.1	55 7.0	149.53	— 0.64	9.997 4498	— 48.6	9 47 29.74
26	299	211 55 19.8	54 56.6	149.62	0.52	9.997 3336	48.2	9 43 33.83
27	300	212 55 11.7	54 48.4	149.71	0.39	9.997 2185	47.8	9 39 37.92
28	301	213 55 5.8	54 42.3	149.80	— 0.27	9.997 1044	— 47.4	9 35 42.02
29	302	214 55 2.0	54 38.5	149.89	0.16	9.996 9911	47.0	9 31 46.11
30	303	215 55 0.5	54 36.8	149.98	— 0.05	9.996 8786	46.7	9 27 50.20
31	304	216 55 1.1	54 37.3	150.07	+ 0.05	9.996 7669	46.4	9 23 54.29
32	305	217 55 3.8	54 39.9	150.16	+ 0.13	9.996 6559	— 46.1	9 19 58.38

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,  
—9<sup>h</sup>.8296.  
(Table II.)



## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	"	"	"	"	"	"	h m	m	d
1	14 49.6	14 51.2	54 18.7	+ 0.39	54 24.7	+ 0.59	20 7.7	1.98	23.6
2	14 53.4	14 56.2	54 32.9	0.77	54 43.2	0.94	20 54.9	1.95	24.6
3	14 59.6	15 3.4	54 55.4	1.08	55 9.3	1.21	21 41.3	1.92	25.6
4	15 7.5	15 11.9	55 24.6	+ 1.32	55 40.9	+ 1.40	22 27.1	1.90	26.6
5	15 16.6	15 21.4	55 58.1	1.45	56 15.8	1.48	23 12.8	1.91	27.6
6	15 26.3	15 31.2	56 33.8	1.49	56 51.6	1.47	23 59.0	1.94	28.6
7	15 36.0	15 40.6	57 9.1	+ 1.43	57 26.0	+ 1.37	6	.	0.1
8	15 44.9	15 49.0	57 42.0	1.29	57 56.9	1.19	0 46.4	2.01	1.1
9	15 52.7	15 56.1	58 10.6	1.09	58 23.0	0.98	1 35.8	2.11	2.1
10	15 59.1	16 1.7	58 34.0	+ 0.86	58 43.7	+ 0.75	2 27.7	2.22	3.1
11	16 4.0	16 5.8	58 51.9	0.63	58 58.8	0.52	3 22.6	2.34	4.1
12	16 7.4	16 8.5	59 4.4	0.41	59 8.7	0.31	4 20.1	2.44	5.1
13	16 9.4	16 9.9	59 11.8	+ 0.21	59 13.7	+ 0.11	5 19.3	2.48	6.1
14	16 10.1	16 10.0	59 14.5	+ 0.02	59 14.2	- 0.08	6 18.7	2.46	7.1
15	16 9.6	16 8.9	59 12.7	- 0.18	59 9.9	0.28	7 16.8	2.38	8.1
16	16 7.8	16 6.3	59 5.9	- 0.39	59 0.6	- 0.50	8 12.8	2.27	9.1
17	16 4.5	16 2.3	58 53.9	0.62	58 45.7	0.74	9 6.1	2.16	10.1
18	15 59.6	15 56.6	58 36.0	0.87	58 24.8	0.99	9 56.9	2.07	11.1
19	15 53.2	15 49.3	58 12.2	- 1.11	57 58.2	- 1.22	10 45.8	2.01	12.1
20	15 45.2	15 40.7	57 43.0	1.32	57 26.6	1.40	11 33.5	1.98	13.1
21	15 36.0	15 31.2	57 9.3	1.46	56 51.5	1.50	12 20.8	1.97	14.1
22	15 26.2	15 21.3	56 33.2	- 1.52	56 15.0	- 1.51	13 8.3	1.99	15.1
23	15 16.3	15 11.6	55 57.0	1.48	55 39.6	1.41	13 56.2	2.01	16.1
24	15 7.1	15 2.9	55 23.0	1.33	55 7.7	1.21	14 44.7	2.04	17.1
25	14 59.2	14 55.8	54 53.9	- 1.09	54 41.7	- 0.93	15 34.0	2.05	18.1
26	14 53.1	14 50.9	54 31.5	0.76	54 23.5	0.57	16 23.2	2.05	19.1
27	14 49.3	14 48.4	54 17.8	- 0.37	54 14.5	- 0.16	17 12.2	2.02	20.1
28	14 48.2	14 48.8	54 13.8	+ 0.05	54 15.7	+ 0.27	18 0.4	1.98	21.1
29	14 50.0	14 52.0	54 20.4	0.49	54 27.6	0.70	18 47.5	1.94	22.1
30	14 54.6	14 57.9	54 37.1	0.90	54 49.3	1.11	19 33.7	1.91	23.1
31	15 1.9	15 6.4	55 3.8	1.30	55 20.4	1.46	20 19.2	1.89	24.1
32	15 11.4	15 16.9	55 38.9	+ 1.60	55 59.0	+ 1.73	21 4.4	1.89	25.1

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 1.					THURSDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 5 7.08	2.1080	N.21 7 35.8	3.581	0	9 44 52.89	2.0469	N.16 27 25.7	7.946
1	8 7 13.53	2.1070	21 3 58.0	3.680	1	9 46 55.67	2.0457	16 19 26.5	8.027
2	8 9 19.92	2.1060	21 0 14.2	3.779	2	9 48 58.37	2.0444	16 11 22.5	8.106
3	8 11 26.25	2.1048	20 56 24.5	3.877	3	9 51 1.00	2.0432	16 3 13.8	8.186
4	8 13 32.50	2.1037	20 52 28.9	3.975	4	9 53 3.56	2.0420	15 55 0.2	8.266
5	8 15 38.69	2.1026	20 48 27.5	4.072	5	9 55 6.04	2.0407	15 46 41.9	8.343
6	8 17 44.81	2.1015	20 44 20.2	4.171	6	9 57 8.44	2.0395	15 38 19.0	8.421
7	8 19 50.87	2.1003	20 40 7.0	4.268	7	9 59 10.78	2.0383	15 29 51.4	8.498
8	8 21 56.85	2.0991	20 35 48.0	4.365	8	10 1 13.04	2.0372	15 21 19.2	8.575
9	8 24 2.76	2.0979	20 31 23.2	4.462	9	10 3 15.24	2.0360	15 12 42.4	8.652
10	8 26 8.60	2.0967	20 26 52.6	4.558	10	10 5 17.36	2.0348	15 4 1.0	8.727
11	8 28 14.37	2.0956	20 22 16.2	4.654	11	10 7 19.41	2.0337	14 55 15.1	8.802
12	8 30 20.07	2.0943	20 17 34.1	4.750	12	10 9 21.40	2.0326	14 46 24.7	8.877
13	8 32 25.69	2.0931	20 12 46.2	4.846	13	10 11 23.32	2.0315	14 37 29.9	8.951
14	8 34 31.24	2.0918	20 7 52.6	4.941	14	10 13 25.18	2.0304	14 28 30.6	9.025
15	8 36 36.71	2.0906	20 2 53.3	5.035	15	10 15 26.97	2.0292	14 19 26.9	9.097
16	8 38 42.11	2.0893	19 57 48.4	5.129	16	10 17 28.69	2.0282	14 10 18.9	9.170
17	8 40 47.43	2.0880	19 52 37.8	5.224	17	10 19 30.35	2.0272	14 1 6.5	9.242
18	8 42 52.67	2.0867	19 47 21.5	5.318	18	10 21 31.96	2.0262	13 51 49.9	9.312
19	8 44 57.84	2.0855	19 41 59.6	5.412	19	10 23 33.50	2.0252	13 42 29.1	9.382
20	8 47 2.93	2.0842	19 36 32.1	5.505	20	10 25 34.99	2.0243	13 33 4.0	9.452
21	8 49 7.94	2.0828	19 30 59.0	5.597	21	10 27 36.42	2.0233	13 23 34.8	9.522
22	8 51 12.87	2.0815	19 25 20.4	5.689	22	10 29 37.79	2.0222	13 14 1.4	9.591
23	8 53 17.72	2.0802	N.19 19 36.3	5.782	23	10 31 39.11	2.0216	N.13 4 23.9	9.658
WEDNESDAY 2.					FRIDAY 4.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 55 22.49	2.0788	N.19 13 46.6	5.874	0	10 33 40.38	2.0207	N.12 54 42.4	9.725
1	8 57 27.18	2.0776	19 7 51.4	5.965	1	10 35 41.59	2.0198	12 44 56.9	9.792
2	8 59 31.80	2.0762	19 1 50.8	6.055	2	10 37 42.76	2.0190	12 35 7.3	9.859
3	9 1 36.33	2.0748	18 55 44.8	6.146	3	10 39 43.87	2.0182	12 25 13.8	9.924
4	9 3 40.78	2.0735	18 49 33.3	6.237	4	10 41 44.94	2.0174	12 15 16.4	9.988
5	9 5 45.15	2.0722	18 43 16.4	6.326	5	10 43 45.96	2.0167	12 5 15.2	10.052
6	9 7 49.44	2.0708	18 36 54.2	6.415	6	10 45 46.94	2.0160	11 55 10.1	10.117
7	9 9 53.65	2.0695	18 30 26.6	6.504	7	10 47 47.88	2.0152	11 45 1.2	10.179
8	9 11 57.78	2.0681	18 23 53.7	6.592	8	10 49 48.77	2.0146	11 34 48.6	10.241
9	9 14 1.82	2.0667	18 17 15.6	6.680	9	10 51 49.63	2.0140	11 24 32.3	10.302
10	9 16 5.79	2.0654	18 10 32.1	6.768	10	10 53 50.45	2.0133	11 14 12.3	10.364
11	9 18 9.67	2.0640	18 3 43.4	6.855	11	10 55 51.23	2.0127	11 3 48.6	10.424
12	9 20 13.47	2.0627	17 56 49.5	6.942	12	10 57 51.98	2.0122	10 53 21.4	10.483
13	9 22 17.19	2.0614	17 49 50.4	7.028	13	10 59 52.70	2.0117	10 42 50.6	10.542
14	9 24 20.84	2.0601	17 42 46.1	7.114	14	11 1 53.38	2.0112	10 32 16.3	10.600
15	9 26 24.40	2.0587	17 35 36.7	7.199	15	11 3 54.04	2.0107	10 21 38.6	10.657
16	9 28 27.88	2.0573	17 28 22.2	7.284	16	11 5 54.67	2.0103	10 10 57.4	10.714
17	9 30 31.28	2.0560	17 21 2.6	7.369	17	11 7 55.28	2.0099	10 0 12.9	10.770
18	9 32 34.60	2.0547	17 13 37.9	7.452	18	11 9 55.86	2.0095	9 49 25.0	10.826
19	9 34 37.85	2.0534	17 6 8.3	7.536	19	11 11 56.42	2.0092	9 38 33.8	10.880
20	9 36 41.01	2.0521	16 58 33.6	7.619	20	11 13 56.97	2.0089	9 27 39.4	10.933
21	9 38 44.10	2.0508	16 50 54.0	7.701	21	11 15 57.49	2.0086	9 16 41.8	10.987
22	9 40 47.11	2.0495	16 43 9.5	7.783	22	11 17 58.00	2.0082	9 5 41.0	11.039
23	9 42 50.04	2.0482	16 35 20.0	7.865	23	11 19 58.50	2.0082	8 54 37.1	11.090
24	9 44 52.89	2.0469	N.16 27 25.7	7.946	24	11 21 58.99	2.0081	N. 8 43 30.2	11.140

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 5.					MONDAY 7.				
0	11 21 58.99	2.0081	N. 8 43 30.2	11.140	0	12 58 56.65	2.0487	S. 0 53 48.4	12.563
1	11 23 59.47	2.0079	8 32 20.3	11.191	1	13 0 59.63	2.0506	1 6 22.4	12.569
2	11 25 59.94	2.0078	8 21 7.3	11.240	2	13 3 2.72	2.0526	1 18 56.7	12.574
3	11 28 0.41	2.0078	8 9 51.5	11.288	3	13 5 5.94	2.0547	1 31 31.3	12.578
4	11 30 0.88	2.0078	7 58 32.7	11.337	4	13 7 9.28	2.0567	1 44 6.1	12.582
5	11 32 1.34	2.0078	7 47 11.1	11.383	5	13 9 12.75	2.0589	1 56 41.1	12.583
6	11 34 1.81	2.0079	7 35 46.8	11.428	6	13 11 16.35	2.0611	2 9 16.1	12.583
7	11 36 2.29	2.0080	7 24 19.7	11.474	7	13 13 20.08	2.0633	2 21 51.1	12.583
8	11 38 2.77	2.0081	7 12 49.9	11.518	8	13 15 23.95	2.0657	2 34 26.1	12.582
9	11 40 3.26	2.0083	7 1 17.5	11.562	9	13 17 27.96	2.0680	2 47 1.0	12.579
10	11 42 3.77	2.0086	6 49 42.5	11.604	10	13 19 32.11	2.0703	2 59 35.6	12.575
11	11 44 4.29	2.0087	6 38 5.0	11.647	11	13 21 36.40	2.0727	3 12 10.0	12.571
12	11 46 4.82	2.0090	6 26 24.9	11.688	12	13 23 40.84	2.0752	3 24 44.1	12.565
13	11 48 5.37	2.0094	6 14 42.4	11.728	13	13 25 45.43	2.0778	3 37 17.8	12.557
14	11 50 5.95	2.0098	6 2 57.5	11.767	14	13 27 50.17	2.0803	3 49 51.0	12.549
15	11 52 6.55	2.0102	5 51 10.3	11.806	15	13 29 55.07	2.0830	4 2 23.7	12.540
16	11 54 7.17	2.0107	5 39 20.8	11.843	16	13 32 0.13	2.0857	4 14 55.8	12.530
17	11 56 7.83	2.0112	5 27 29.1	11.881	17	13 34 5.35	2.0884	4 27 27.3	12.518
18	11 58 8.51	2.0117	5 15 35.1	11.917	18	13 36 10.74	2.0912	4 39 58.0	12.504
19	12 0 9.23	2.0123	5 3 39.0	11.952	19	13 38 16.29	2.0939	4 52 27.8	12.490
20	12 2 9.99	2.0129	4 51 40.9	11.986	20	13 40 22.01	2.0967	5 4 56.8	12.476
21	12 4 10.78	2.0136	4 39 40.7	12.020	21	13 42 27.90	2.0997	5 17 24.9	12.460
22	12 6 11.62	2.0143	4 27 38.5	12.052	22	13 44 33.97	2.1027	5 29 52.0	12.442
23	12 8 12.50	2.0150	N. 4 15 34.4	12.084	23	13 46 40.22	2.1057	S. 5 42 17.9	12.422
SUNDAY 6.					TUESDAY 8.				
0	12 10 13.42	2.0158	N. 4 3 28.4	12.115	0	13 48 46.65	2.1087	S. 5 54 42.7	12.403
1	12 12 14.40	2.0167	3 51 20.6	12.144	1	13 50 53.26	2.1117	6 7 6.3	12.382
2	12 14 15.42	2.0175	3 39 11.1	12.173	2	13 53 0.06	2.1149	6 19 28.5	12.359
3	12 16 16.50	2.0185	3 26 59.8	12.202	3	13 55 7.05	2.1181	6 31 49.4	12.337
4	12 18 17.64	2.0195	3 14 46.9	12.228	4	13 57 14.23	2.1213	6 44 8.9	12.312
5	12 20 18.84	2.0205	3 2 32.4	12.254	5	13 59 21.61	2.1246	6 56 26.8	12.285
6	12 22 20.10	2.0216	2 50 16.4	12.279	6	14 1 29.18	2.1278	7 8 43.1	12.258
7	12 24 21.43	2.0227	2 37 58.9	12.304	7	14 3 36.95	2.1312	7 20 57.8	12.230
8	12 26 22.82	2.0238	2 25 39.9	12.327	8	14 5 44.93	2.1347	7 33 10.7	12.200
9	12 28 24.28	2.0250	2 13 19.6	12.349	9	14 7 53.11	2.1381	7 45 21.8	12.169
10	12 30 25.82	2.0263	2 0 58.0	12.371	10	14 10 1.50	2.1415	7 57 31.0	12.137
11	12 32 27.44	2.0276	1 48 35.1	12.391	11	14 12 10.09	2.1450	8 9 38.2	12.103
12	12 34 29.13	2.0289	1 36 11.1	12.410	12	14 14 18.90	2.1486	8 21 43.4	12.068
13	12 36 30.91	2.0303	1 23 45.9	12.428	13	14 16 27.92	2.1522	8 33 46.4	12.032
14	12 38 32.77	2.0317	1 11 19.7	12.446	14	14 18 37.16	2.1558	8 45 47.3	11.996
15	12 40 34.71	2.0332	0 58 52.4	12.462	15	14 20 46.62	2.1596	8 57 45.9	11.957
16	12 42 36.75	2.0347	0 46 24.2	12.477	16	14 22 56.31	2.1633	9 9 42.1	11.917
17	12 44 38.88	2.0363	0 33 55.1	12.492	17	14 25 6.22	2.1670	9 21 35.9	11.876
18	12 46 41.11	2.0379	0 21 25.2	12.505	18	14 27 16.35	2.1707	9 33 27.2	11.833
19	12 48 43.43	2.0396	N. 0 8 54.5	12.517	19	14 29 26.71	2.1746	9 45 15.9	11.789
20	12 50 45.86	2.0414	S. 0 3 36.9	12.529	20	14 31 37.30	2.1785	9 57 1.9	11.744
21	12 52 48.40	2.0432	0 16 9.0	12.539	21	14 33 48.13	2.1824	10 8 45.2	11.698
22	12 54 51.04	2.0449	0 28 41.6	12.548	22	14 35 59.19	2.1863	10 20 25.7	11.651
23	12 56 53.79	2.0467	0 41 14.8	12.557	23	14 38 10.49	2.1903	10 32 3.3	11.602
24	12 58 56.65	2.0487	S. 0 53 48.4	12.563	24	14 40 22.03	2.1943	S. 10 43 38.0	11.552

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 9.					FRIDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	14 40 22.03	2.1943	S. 10 43 38.0	11.558	0	16 30 42.38	2.4054	S. 18 35 36.4	7.619
1	14 42 33.81	2.1983	10 55 9.6	11.501	1	16 33 6.83	2.4097	18 43 10.2	7.507
2	14 44 45.83	2.2024	11 6 38.1	11.448	2	16 35 31.54	2.4139	18 50 37.2	7.392
3	14 46 58.10	2.2065	11 18 3.4	11.394	3	16 37 56.50	2.4181	18 57 57.3	7.277
4	14 49 10.61	2.2107	11 29 25.4	11.338	4	16 40 21.71	2.4223	19 5 10.5	7.162
5	14 51 23.38	2.2148	11 40 44.0	11.282	5	16 42 47.17	2.4265	19 12 16.7	7.044
6	14 53 36.39	2.2189	11 51 59.2	11.224	6	16 45 12.87	2.4304	19 19 15.8	6.926
7	14 55 49.65	2.2232	12 3 10.9	11.165	7	16 47 38.82	2.4344	19 26 7.8	6.807
8	14 58 3.17	2.2275	12 14 19.0	11.104	8	16 50 5.00	2.4383	19 32 52.7	6.687
9	15 0 16.95	2.2317	12 25 23.4	11.042	9	16 52 31.42	2.4423	19 39 30.3	6.566
10	15 2 30.98	2.2359	12 36 24.1	10.980	10	16 54 58.08	2.4462	19 46 0.6	6.444
11	15 4 45.26	2.2402	12 47 21.0	10.915	11	16 57 24.97	2.4501	19 52 23.6	6.321
12	15 6 59.81	2.2447	12 58 13.9	10.848	12	16 59 52.09	2.4538	19 58 39.1	6.196
13	15 9 14.62	2.2490	13 9 2.8	10.782	13	17 2 19.43	2.4576	20 4 47.1	6.070
14	15 11 29.69	2.2534	13 19 47.7	10.714	14	17 4 47.00	2.4613	20 10 47.5	5.943
15	15 13 45.03	2.2578	13 30 28.5	10.644	15	17 7 14.79	2.4649	20 16 40.3	5.817
16	15 16 0.63	2.2622	13 41 5.0	10.572	16	17 9 42.79	2.4685	20 22 25.5	5.688
17	15 18 16.50	2.2667	13 51 37.2	10.500	17	17 12 11.01	2.4720	20 28 2.9	5.559
18	15 20 32.63	2.2711	14 2 5.0	10.427	18	17 14 39.43	2.4754	20 33 32.6	5.429
19	15 22 49.03	2.2756	14 12 28.4	10.352	19	17 17 8.06	2.4789	20 38 54.4	5.297
20	15 25 5.70	2.2801	14 22 47.2	10.275	20	17 19 36.90	2.4822	20 44 8.3	5.166
21	15 27 22.64	2.2846	14 33 1.4	10.197	21	17 22 5.93	2.4854	20 49 14.3	5.033
22	15 29 39.85	2.2891	14 43 10.9	10.119	22	17 24 35.15	2.4886	20 54 12.3	4.899
23	15 31 57.33	2.2936	S. 14 53 15.7	10.039	23	17 27 4.56	2.4917	S. 20 59 2.2	4.765
THURSDAY 10.					SATURDAY 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	15 34 15.08	2.2981	S. 15 3 15.6	9.957	0	17 29 34.16	2.4948	S. 21 3 44.1	4.630
1	15 36 33.10	2.3027	15 13 10.6	9.874	1	17 32 3.94	2.4977	21 8 17.8	4.494
2	15 38 51.40	2.3072	15 23 0.5	9.790	2	17 34 33.89	2.5007	21 12 43.4	4.357
3	15 41 9.97	2.3117	15 32 45.4	9.705	3	17 37 4.02	2.5035	21 17 0.7	4.219
4	15 43 28.81	2.3162	15 42 25.1	9.617	4	17 39 34.31	2.5062	21 21 9.7	4.081
5	15 45 47.92	2.3208	15 51 59.5	9.529	5	17 42 4.77	2.5090	21 25 10.4	3.942
6	15 48 7.31	2.3253	16 1 28.6	9.440	6	17 44 35.39	2.5116	21 29 2.8	3.803
7	15 50 26.96	2.3298	16 10 52.3	9.350	7	17 47 6.16	2.5141	21 32 46.8	3.662
8	15 52 46.89	2.3345	16 20 10.6	9.258	8	17 49 37.08	2.5165	21 36 22.3	3.522
9	15 55 7.10	2.3390	16 29 23.3	9.165	9	17 52 8.14	2.5188	21 39 49.4	3.381
10	15 57 27.57	2.3434	16 38 30.4	9.070	10	17 54 39.34	2.5212	21 43 8.0	3.238
11	15 59 48.31	2.3480	16 47 31.7	8.974	11	17 57 10.68	2.5234	21 46 18.0	3.095
12	16 2 9.33	2.3526	16 56 27.3	8.877	12	17 59 42.15	2.5255	21 49 19.4	2.952
13	16 4 30.62	2.3570	17 5 17.0	8.779	13	18 2 13.74	2.5275	21 52 12.2	2.808
14	16 6 52.17	2.3615	17 14 0.8	8.680	14	18 4 45.45	2.5294	21 54 56.4	2.664
15	16 9 14.00	2.3661	17 22 38.6	8.579	15	18 7 17.27	2.5312	21 57 31.9	2.519
16	16 11 36.10	2.3705	17 31 10.3	8.477	16	18 9 49.20	2.5330	21 59 58.7	2.374
17	16 13 58.46	2.3749	17 39 35.8	8.373	17	18 12 21.23	2.5347	22 2 16.8	2.228
18	16 16 21.09	2.3793	17 47 55.1	8.270	18	18 14 53.36	2.5362	22 4 26.1	2.082
19	16 18 43.98	2.3837	17 56 8.2	8.165	19	18 17 25.58	2.5377	22 6 26.7	1.936
20	16 21 7.14	2.3882	18 4 14.9	8.057	20	18 19 57.89	2.5391	22 8 18.4	1.788
21	16 23 30.56	2.3925	18 12 15.1	7.949	21	18 22 30.27	2.5403	22 10 1.3	1.642
22	16 25 54.24	2.3968	18 20 8.8	7.840	22	18 25 2.73	2.5415	22 11 35.4	1.494
23	16 28 18.18	2.4012	18 27 55.9	7.730	23	18 27 35.25	2.5426	22 13 0.6	1.347
24	16 30 42.38	2.4054	S. 18 35 36.4	7.619	24	18 30 7.84	2.5437	S. 22 14 17.0	1.199

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 13.					TUESDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	18 30 7.84	2.5437	S. 22 14 17.0	1.199	0	20 31 33.04	2.4814	S. 20 22 22.2	5.724
1	18 32 40.49	2.5445	22 15 24.5	1.051	1	20 34 1.83	2.4782	20 16 34.8	5.855
2	18 35 13.18	2.5452	22 16 23.1	0.902	2	20 36 30.42	2.4748	20 10 39.6	5.984
3	18 37 45.92	2.5460	22 17 12.7	0.753	3	20 38 58.81	2.4714	20 4 36.7	6.113
4	18 40 18.70	2.5467	22 17 53.5	0.605	4	20 41 26.99	2.4680	19 58 26.0	6.242
5	18 42 51.52	2.5472	22 18 25.3	0.455	5	20 43 54.97	2.4646	19 52 7.6	6.369
6	18 45 24.36	2.5476	22 18 48.1	0.306	6	20 46 22.74	2.4611	19 45 41.7	6.495
7	18 47 57.23	2.5479	22 19 2.0	0.157	7	20 48 50.30	2.4575	19 39 8.2	6.621
8	18 50 30.11	2.5481	22 19 7.0	-0.008	8	20 51 17.64	2.4538	19 32 27.2	6.745
9	18 53 3.00	2.5482	22 19 3.0	+0.141	9	20 53 44.76	2.4502	19 25 38.8	6.867
10	18 55 35.89	2.5482	22 18 50.1	0.290	10	20 56 11.66	2.4464	19 18 43.1	6.990
11	18 58 8.78	2.5482	22 18 28.2	0.440	11	20 58 38.33	2.4427	19 11 40.0	7.112
12	19 0 41.67	2.5480	22 17 57.3	0.589	12	21 1 4.78	2.4389	19 4 29.7	7.232
13	19 3 14.54	2.5477	22 17 17.5	0.737	13	21 3 31.00	2.4351	18 57 12.2	7.351
14	19 5 47.39	2.5473	22 16 28.8	0.887	14	21 5 56.99	2.4312	18 49 47.6	7.468
15	19 8 20.22	2.5468	22 15 31.1	1.037	15	21 8 22.75	2.4273	18 42 16.0	7.585
16	19 10 53.01	2.5462	22 14 24.4	1.185	16	21 10 48.27	2.4233	18 34 37.4	7.702
17	19 13 25.77	2.5456	22 13 8.9	1.333	17	21 13 13.55	2.4194	18 26 51.8	7.817
18	19 15 58.48	2.5448	22 11 44.5	1.482	18	21 15 38.60	2.4154	18 18 59.4	7.929
19	19 18 31.15	2.5440	22 10 11.1	1.630	19	21 18 3.40	2.4113	18 11 0.3	8.042
20	19 21 3.76	2.5430	22 8 28.9	1.777	20	21 20 27.96	2.4073	18 2 54.4	8.154
21	19 23 36.31	2.5419	22 6 37.8	1.925	21	21 22 52.28	2.4032	17 54 41.8	8.264
22	19 26 8.79	2.5407	22 4 37.9	2.072	22	21 25 16.35	2.3992	17 46 22.7	8.373
23	19 28 41.20	2.5396	S. 22 2 29.1	2.220	23	21 27 40.18	2.3951	S. 17 37 57.1	8.481
MONDAY 14.					WEDNESDAY 16.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	19 31 13.54	2.5383	S. 22 0 11.5	2.367	0	21 30 3.76	2.3909	S. 17 29 25.0	8.587
1	19 33 45.79	2.5368	21 57 45.1	2.512	1	21 32 27.09	2.3867	17 20 46.6	8.692
2	19 36 17.96	2.5353	21 55 10.0	2.658	2	21 34 50.17	2.3826	17 12 1.9	8.797
3	19 38 50.03	2.5337	21 52 26.1	2.804	3	21 37 13.00	2.3784	17 3 10.9	8.901
4	19 41 22.00	2.5320	21 49 33.5	2.949	4	21 39 35.58	2.3742	16 54 13.8	9.002
5	19 43 53.87	2.5302	21 46 32.2	3.093	5	21 41 57.91	2.3700	16 45 10.6	9.103
6	19 46 25.62	2.5283	21 43 22.3	3.237	6	21 44 19.98	2.3657	16 36 1.4	9.202
7	19 48 57.26	2.5264	21 40 3.7	3.382	7	21 46 41.80	2.3616	16 26 46.3	9.301
8	19 51 28.79	2.5244	21 36 36.5	3.525	8	21 49 3.37	2.3574	16 17 25.3	9.397
9	19 54 0.19	2.5223	21 33 0.7	3.667	9	21 51 24.69	2.3532	16 7 58.6	9.493
10	19 56 31.46	2.5200	21 29 16.5	3.808	10	21 53 45.75	2.3489	15 58 26.1	9.588
11	19 59 2.59	2.5177	21 25 23.7	3.951	11	21 56 6.56	2.3447	15 48 48.0	9.681
12	20 1 33.59	2.5154	21 21 22.4	4.092	12	21 58 27.11	2.3404	15 39 4.4	9.772
13	20 4 4.44	2.5129	21 17 12.7	4.232	13	22 0 47.41	2.3362	15 29 15.3	9.863
14	20 6 35.14	2.5104	21 12 54.6	4.371	14	22 3 7.45	2.3319	15 19 20.8	9.953
15	20 9 5.69	2.5078	21 8 28.2	4.509	15	22 5 27.24	2.3277	15 9 20.9	10.042
16	20 11 36.08	2.5052	21 3 53.5	4.647	16	22 7 46.78	2.3236	14 59 15.8	10.128
17	20 14 6.31	2.5025	20 59 10.5	4.785	17	22 10 6.07	2.3193	14 49 5.6	10.212
18	20 16 36.38	2.4997	20 54 19.3	4.921	18	22 12 25.10	2.3151	14 38 50.3	10.297
19	20 19 6.27	2.4967	20 49 20.0	5.057	19	22 14 43.88	2.3109	14 28 29.9	10.381
20	20 21 35.99	2.4938	20 44 12.5	5.192	20	22 17 2.41	2.3067	14 18 4.6	10.462
21	20 24 5.53	2.4908	20 38 56.9	5.327	21	22 19 20.69	2.3026	14 7 34.4	10.542
22	20 26 34.89	2.4877	20 33 33.3	5.460	22	22 21 38.72	2.2984	13 56 59.5	10.621
23	20 29 4.06	2.4846	20 28 1.7	5.592	23	22 23 56.50	2.2942	13 46 19.9	10.699
24	20 31 33.04	2.4814	S. 20 22 22.2	5.724	24	22 26 14.03	2.2902	S. 13 35 35.6	10.776

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 17.					SATURDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	22 26 14.03	2.2908	S. 13 35 35.6	10.776	0	11 57.76	2.1297	S. 3 55 28.7	12.893
1	22 28 31.32	2.2861	13 24 46.8	10.851	1	0 14 5.47	2.1273	3 42 34.7	12.906
2	22 30 48.36	2.2820	13 13 53.5	10.924	2	0 16 13.04	2.1251	3 29 40.0	12.917
3	22 33 5.16	2.2779	13 2 55.9	10.996	3	0 18 20.48	2.1229	3 16 44.6	12.927
4	22 35 21.71	2.2738	12 51 54.0	11.067	4	0 20 27.79	2.1207	3 3 48.7	12.936
5	22 37 38.02	2.2698	12 40 47.8	11.137	5	0 22 34.97	2.1186	2 50 52.3	12.944
6	22 39 54.09	2.2659	12 29 37.5	11.206	6	0 24 42.02	2.1165	2 37 55.4	12.951
7	22 42 9.93	2.2619	12 18 23.1	11.273	7	0 26 48.95	2.1145	2 24 58.2	12.956
8	22 44 25.52	2.2579	12 7 4.7	11.339	8	0 28 55.76	2.1125	2 12 0.7	12.960
9	22 46 40.88	2.2541	11 55 42.4	11.403	9	0 31 2.45	2.1106	1 59 3.0	12.962
10	22 48 56.01	2.2508	11 44 16.3	11.467	10	0 33 9.03	2.1087	1 46 5.2	12.963
11	22 51 10.90	2.2462	11 32 46.4	11.528	11	0 35 15.50	2.1069	1 33 7.4	12.964
12	22 53 25.56	2.2424	11 21 12.9	11.588	12	0 37 21.86	2.1051	1 20 9.5	12.964
13	22 55 39.99	2.2386	11 9 35.8	11.647	13	0 39 28.11	2.1033	1 7 11.7	12.962
14	22 57 54.19	2.2348	10 57 55.2	11.706	14	0 41 34.26	2.1017	0 54 14.1	12.958
15	23 0 8.17	2.2312	10 46 11.1	11.762	15	0 43 40.31	2.1000	0 41 16.7	12.954
16	23 2 21.93	2.2274	10 34 23.7	11.817	16	0 45 46.26	2.0984	0 28 19.6	12.948
17	23 4 35.46	2.2237	10 22 33.0	11.872	17	0 47 52.12	2.0969	0 15 22.9	12.942
18	23 6 48.78	2.2201	10 10 39.1	11.924	18	0 49 57.89	2.0953	S. 0 2 26.6	12.934
19	23 9 1.87	2.2164	9 58 42.1	11.975	19	0 52 3.56	2.0938	N. 0 10 29.2	12.926
20	23 11 14.75	2.2129	9 46 42.1	12.025	20	0 54 9.15	2.0925	0 23 24.5	12.916
21	23 13 27.42	2.2094	9 34 39.1	12.074	21	0 56 14.66	2.0912	0 36 19.1	12.904
22	23 15 39.88	2.2059	9 22 33.2	12.121	22	0 58 20.09	2.0898	0 49 13.0	12.892
23	23 17 52.13	2.2024	S. 9 10 24.6	12.167	23	1 0 25.44	2.0885	N. 1 2 6.1	12.877
FRIDAY 18.					SUNDAY 20.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	23 20 4.17	2.1990	S. 8 58 13.2	12.212	0	1 2 30.71	2.0872	N. 1 14 58.3	12.863
1	23 22 16.01	2.1956	8 45 59.2	12.255	1	1 4 35.91	2.0861	1 27 49.6	12.847
2	23 24 27.64	2.1922	8 33 42.6	12.297	2	1 6 41.04	2.0850	1 40 40.0	12.831
3	23 26 39.08	2.1890	8 21 23.6	12.337	3	1 8 46.11	2.0839	1 53 29.3	12.812
4	23 28 50.32	2.1857	8 9 2.2	12.377	4	1 10 51.11	2.0828	2 6 17.5	12.793
5	23 31 1.36	2.1824	7 56 38.4	12.415	5	1 12 56.05	2.0818	2 19 4.5	12.772
6	23 33 12.21	2.1793	7 44 12.4	12.452	6	1 15 0.93	2.0809	2 31 50.2	12.751
7	23 35 22.88	2.1762	7 31 44.2	12.487	7	1 17 5.76	2.0800	2 44 34.6	12.729
8	23 37 33.36	2.1731	7 19 14.0	12.521	8	1 19 10.53	2.0791	2 57 17.7	12.706
9	23 39 43.65	2.1700	7 6 41.7	12.554	9	1 21 15.25	2.0782	3 9 59.3	12.681
10	23 41 53.76	2.1670	6 54 7.5	12.586	10	1 23 19.92	2.0775	3 22 39.4	12.656
11	23 44 3.69	2.1641	6 41 31.4	12.616	11	1 25 24.55	2.0768	3 35 18.0	12.629
12	23 46 13.45	2.1612	6 28 53.6	12.644	12	1 27 29.14	2.0762	3 47 54.9	12.601
13	23 48 23.03	2.1582	6 16 14.1	12.672	13	1 29 33.69	2.0755	4 0 30.1	12.572
14	23 50 32.44	2.1554	6 3 32.9	12.699	14	1 31 38.20	2.0748	4 13 3.6	12.542
15	23 52 41.68	2.1527	5 50 50.2	12.724	15	1 33 42.67	2.0743	4 25 35.2	12.511
16	23 54 50.76	2.1500	5 38 6.0	12.748	16	1 35 47.12	2.0738	4 38 4.9	12.479
17	23 56 59.68	2.1472	5 25 20.4	12.771	17	1 37 51.53	2.0732	4 50 32.7	12.447
18	23 59 8.43	2.1446	5 12 33.5	12.792	18	1 39 55.91	2.0728	5 2 58.5	12.412
19	0 1 17.03	2.1420	4 59 45.4	12.812	19	1 42 0.27	2.0725	5 15 22.2	12.377
20	0 3 25.47	2.1395	4 46 56.1	12.831	20	1 44 4.61	2.0722	5 27 43.8	12.342
21	0 5 33.77	2.1370	4 34 5.7	12.848	21	1 46 8.93	2.0718	5 40 3.2	12.304
22	0 7 41.91	2.1345	4 21 14.3	12.865	22	1 48 13.23	2.0716	5 52 20.3	12.266
23	0 9 49.91	2.1321	4 8 21.9	12.880	23	1 50 17.52	2.0713	6 4 35.1	12.227
24	0 11 57.76	2.1297	S. 3 55 28.7	12.893	24	1 52 21.79	2.0711	N. 6 16 47.6	12.187

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 21.					WEDNESDAY 23.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
1	1 52 21.79	2.0711	6 16 47.6	12.187	1	3 32 10.15	2.0970	15 58 20.1	9.227
2	1 54 26.05	2.0710	6 28 57.6	12.146	2	3 34 16.00	2.0981	15 7 31.3	9.146
3	1 56 30.31	2.0709	6 41 5.1	12.104	3	3 36 21.92	2.0992	15 16 37.6	9.064
4	1 58 34.56	2.0707	6 53 10.1	12.062	4	3 38 27.90	2.1002	15 25 39.0	8.982
5	2 0 38.80	2.0707	7 5 12.5	12.017	5	3 40 33.94	2.1012	15 34 35.5	8.901
6	2 2 43.05	2.0707	7 17 12.2	11.972	6	3 42 40.05	2.1022	15 43 27.1	8.817
7	2 4 47.29	2.0707	7 29 9.1	11.926	7	3 44 46.21	2.1032	15 52 13.6	8.733
8	2 6 51.54	2.0708	7 41 3.3	11.880	8	3 46 52.44	2.1044	16 0 55.1	8.649
9	2 8 55.79	2.0709	7 52 54.7	11.832	9	3 48 58.74	2.1055	16 9 31.5	8.564
10	2 11 0.05	2.0711	8 4 43.2	11.783	10	3 51 5.10	2.1065	16 18 2.8	8.479
11	2 13 4.32	2.0713	8 16 28.7	11.733	11	3 53 11.52	2.1075	16 26 29.0	8.393
12	2 15 8.61	2.0715	8 28 11.2	11.682	12	3 55 18.00	2.1086	16 34 50.0	8.307
13	2 17 12.90	2.0717	8 39 50.6	11.631	13	3 57 24.55	2.1097	16 43 5.8	8.219
14	2 19 17.21	2.0719	8 51 26.9	11.579	14	3 59 31.16	2.1107	16 51 16.3	8.132
15	2 21 21.53	2.0722	9 3 0.1	11.526	15	4 1 37.84	2.1119	16 59 21.6	8.043
16	2 23 25.88	2.0726	9 14 30.0	11.471	16	4 3 44.59	2.1129	17 7 21.5	7.953
17	2 25 30.24	2.0729	9 25 56.6	11.416	17	4 5 51.39	2.1139	17 15 16.0	7.864
18	2 27 34.63	2.0734	9 37 19.9	11.361	18	4 7 58.26	2.1151	17 23 5.2	7.775
19	2 29 39.05	2.0738	9 48 39.9	11.304	19	4 10 5.20	2.1162	17 30 49.0	7.684
20	2 31 43.49	2.0742	9 59 56.4	11.246	20	4 12 12.20	2.1172	17 38 27.3	7.593
21	2 33 47.95	2.0746	10 11 9.4	11.187	21	4 14 19.26	2.1182	17 46 0.2	7.502
22	2 35 52.44	2.0752	10 22 18.9	11.128	22	4 16 26.39	2.1193	17 53 27.6	7.410
23	2 37 56.97	2.0757	10 33 24.8	11.067	23	4 18 33.58	2.1203	18 0 49.4	7.317
24	2 40 1.53	2.0763	N. 10 44 27.0	11.006	24	4 20 40.83	2.1213	N. 18 8 5.7	7.225
TUESDAY 22.					THURSDAY 24.				
0	2 42 6.13	2.0769	N. 10 55 25.5	10.944	0	4 22 48.14	2.1223	N. 18 15 16.4	7.132
1	2 44 10.76	2.0775	11 6 20.3	10.882	1	4 24 55.51	2.1234	18 22 21.5	7.037
2	2 46 15.43	2.0781	11 17 11.3	10.818	2	4 27 2.95	2.1244	18 29 20.9	6.943
3	2 48 20.13	2.0787	11 27 58.5	10.754	3	4 29 10.44	2.1254	18 36 14.7	6.848
4	2 50 24.87	2.0794	11 38 41.8	10.689	4	4 31 18.00	2.1264	18 43 2.7	6.752
5	2 52 29.66	2.0802	11 49 21.2	10.623	5	4 33 25.61	2.1273	18 49 45.0	6.657
6	2 54 34.49	2.0809	11 59 56.6	10.556	6	4 35 33.28	2.1283	18 56 21.6	6.562
7	2 56 39.37	2.0817	12 10 27.9	10.488	7	4 37 41.01	2.1293	19 2 52.4	6.465
8	2 58 44.29	2.0824	12 20 55.2	10.420	8	4 39 48.80	2.1302	19 9 17.4	6.368
9	3 0 49.26	2.0832	12 31 18.3	10.351	9	4 41 56.64	2.1312	19 15 36.6	6.271
10	3 2 54.28	2.0840	12 41 37.3	10.281	10	4 44 4.54	2.1321	19 21 49.9	6.173
11	3 4 59.34	2.0848	12 51 52.0	10.210	11	4 46 12.49	2.1330	19 27 57.4	6.075
12	3 7 4.46	2.0857	13 2 2.5	10.139	12	4 48 20.50	2.1339	19 33 58.9	5.976
13	3 9 9.63	2.0866	13 12 8.7	10.067	13	4 50 28.56	2.1347	19 39 54.5	5.877
14	3 11 14.85	2.0874	13 22 10.5	9.994	14	4 52 36.67	2.1356	19 45 44.2	5.779
15	3 13 20.12	2.0883	13 32 8.0	9.921	15	4 54 44.83	2.1364	19 51 28.0	5.679
16	3 15 25.45	2.0893	13 42 1.0	9.846	16	4 56 53.04	2.1372	19 57 5.7	5.579
17	3 17 30.84	2.0902	13 51 49.5	9.771	17	4 59 1.30	2.1380	20 2 37.5	5.479
18	3 19 36.28	2.0912	14 1 33.5	9.695	18	5 1 9.60	2.1387	20 8 3.2	5.378
19	3 21 41.78	2.0921	14 11 12.9	9.618	19	5 3 17.95	2.1396	20 13 22.9	5.277
20	3 23 47.33	2.0931	14 20 47.7	9.542	20	5 5 26.35	2.1403	20 18 36.5	5.177
21	3 25 52.95	2.0941	14 30 17.9	9.464	21	5 7 34.79	2.1410	20 23 44.1	5.075
22	3 27 58.62	2.0951	14 39 43.4	9.385	22	5 9 43.27	2.1417	20 28 45.5	4.973
23	3 30 4.36	2.0961	14 49 4.1	9.306	23	5 11 51.79	2.1423	20 33 40.9	4.872
24	3 32 10.15	2.0970	N. 14 58 20.1	9.227	24	5 14 0.35	2.1430	N. 20 38 30.1	4.769

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 25.					SUNDAY 27.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 14 0.35	2.1430	N.20 38 30.1	4.769	0	6 57 5.92	2.1411	N.22 26 24.3	0.297
1	5 16 8.95	2.1437	20 43 13.2	4.667	1	6 59 14.36	2.1402	22 26 3.3	0.403
2	5 18 17.59	2.1442	20 47 50.1	4.563	2	7 1 22.75	2.1394	22 25 35.9	0.509
3	5 20 26.26	2.1448	20 52 20.8	4.460	3	7 3 31.09	2.1386	22 25 2.2	0.614
4	5 22 34.97	2.1454	20 56 45.3	4.357	4	7 5 39.38	2.1377	22 24 22.2	0.719
5	5 24 43.71	2.1459	21 1 3.7	4.254	5	7 7 47.62	2.1368	22 23 35.9	0.824
6	5 26 52.48	2.1463	21 5 15.8	4.150	6	7 9 55.80	2.1359	22 22 43.3	0.929
7	5 29 1.27	2.1468	21 9 21.7	4.046	7	7 12 3.93	2.1349	22 21 44.4	1.034
8	5 31 10.10	2.1473	21 13 21.3	3.942	8	7 14 11.99	2.1339	22 20 39.2	1.138
9	5 33 18.95	2.1477	21 17 14.7	3.837	9	7 16 20.00	2.1329	22 19 27.8	1.242
10	5 35 27.82	2.1481	21 21 1.8	3.733	10	7 18 27.94	2.1318	22 18 10.1	1.347
11	5 37 36.72	2.1485	21 24 42.7	3.628	11	7 20 35.82	2.1308	22 16 46.2	1.450
12	5 39 45.64	2.1488	21 28 17.2	3.522	12	7 22 43.64	2.1297	22 15 16.1	1.554
13	5 41 54.58	2.1492	21 31 45.4	3.418	13	7 24 51.39	2.1287	22 13 39.7	1.657
14	5 44 3.54	2.1494	21 35 7.4	3.313	14	7 26 59.08	2.1275	22 11 57.2	1.761
15	5 46 12.51	2.1497	21 38 23.0	3.207	15	7 29 6.69	2.1262	22 10 8.4	1.865
16	5 48 21.50	2.1499	21 41 32.2	3.102	16	7 31 14.23	2.1251	22 8 13.4	1.967
17	5 50 30.50	2.1501	21 44 35.2	2.997	17	7 33 21.70	2.1239	22 6 12.3	2.070
18	5 52 39.51	2.1502	21 47 31.8	2.890	18	7 35 29.10	2.1227	22 4 5.0	2.172
19	5 54 48.53	2.1504	21 50 22.0	2.784	19	7 37 36.42	2.1214	22 1 51.6	2.275
20	5 56 57.56	2.1506	21 53 5.9	2.679	20	7 39 43.67	2.1202	21 59 32.0	2.377
21	5 59 6.60	2.1507	21 55 43.5	2.573	21	7 41 50.84	2.1188	21 57 6.3	2.479
22	6 1 15.64	2.1507	21 58 14.7	2.467	22	7 43 57.93	2.1175	21 54 34.5	2.580
23	6 3 24.68	2.1507	N.22 0 39.5	2.360	23	7 46 4.94	2.1162	N.21 51 56.7	2.682
SATURDAY 26.					MONDAY 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 5 33.72	2.1507	N.22 2 57.9	2.253	0	7 48 11.87	2.1148	N.21 49 12.7	2.783
1	6 7 42.76	2.1506	22 5 9.9	2.147	1	7 50 18.72	2.1134	21 46 22.7	2.884
2	6 9 51.79	2.1505	22 7 15.6	2.042	2	7 52 25.48	2.1120	21 43 26.6	2.984
3	6 12 0.82	2.1505	22 9 14.9	1.935	3	7 54 32.16	2.1106	21 40 24.6	3.084
4	6 14 9.85	2.1503	22 11 7.8	1.829	4	7 56 38.75	2.1092	21 37 16.5	3.185
5	6 16 18.86	2.1502	22 12 54.4	1.722	5	7 58 45.26	2.1077	21 34 2.4	3.285
6	6 18 27.87	2.1500	22 14 34.5	1.615	6	8 0 51.68	2.1063	21 30 42.3	3.384
7	6 20 36.86	2.1497	22 16 8.2	1.508	7	8 2 58.02	2.1048	21 27 16.3	3.482
8	6 22 45.83	2.1494	22 17 35.5	1.402	8	8 5 4.26	2.1033	21 23 44.4	3.582
9	6 24 54.79	2.1492	22 18 56.4	1.295	9	8 7 10.42	2.1018	21 20 6.5	3.681
10	6 27 3.73	2.1489	22 20 10.9	1.189	10	8 9 16.48	2.1003	21 16 22.7	3.779
11	6 29 12.66	2.1486	22 21 19.1	1.082	11	8 11 22.46	2.0988	21 12 33.0	3.877
12	6 31 21.56	2.1482	22 22 20.8	0.976	12	8 13 28.34	2.0972	21 8 37.5	3.974
13	6 33 30.44	2.1477	22 23 16.2	0.869	13	8 15 34.13	2.0957	21 4 36.1	4.072
14	6 35 39.28	2.1472	22 24 5.1	0.762	14	8 17 39.82	2.0941	21 0 28.9	4.168
15	6 37 48.10	2.1467	22 24 47.7	0.657	15	8 19 45.42	2.0926	20 56 15.9	4.265
16	6 39 56.89	2.1462	22 25 23.9	0.550	16	8 21 50.93	2.0910	20 51 57.1	4.362
17	6 42 5.65	2.1457	22 25 53.7	0.444	17	8 23 56.34	2.0893	20 47 32.5	4.457
18	6 44 14.38	2.1452	22 26 17.2	0.338	18	8 26 1.65	2.0877	20 43 2.2	4.552
19	6 46 23.07	2.1445	22 26 34.3	0.232	19	8 28 6.87	2.0862	20 38 26.2	4.648
20	6 48 31.72	2.1438	22 26 45.0	0.125	20	8 30 11.99	2.0846	20 33 44.4	4.743
21	6 50 40.33	2.1432	22 26 49.3	+0.019	21	8 32 17.02	2.0830	20 28 57.0	4.837
22	6 52 48.90	2.1425	22 26 47.3	-0.086	22	8 34 21.95	2.0813	20 24 3.9	4.932
23	6 54 57.43	2.1418	22 26 39.0	0.192	23	8 36 26.78	2.0797	20 19 5.2	5.026
24	6 57 5.92	2.1411	N.22 26 24.3	0.297	24	8 38 31.51	2.0780	N.20 14 0.8	5.120



GREENWICH MEAN TIME.									
THE MOON'S RIGHT ASCENSION AND DECLINATION.									
Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 29.					THURSDAY 31.				
	<div>h m s</div>		<div>° ' "</div>	<div>"</div>		<div>h m s</div>		<div>° ' "</div>	<div>"</div>
0	8 38 31.51	2.0780	N.20 14 0.8	5.120	0	10 16 27.34	2.0073	N.14 28 22.4	9.109
1	8 40 36.14	2.0764	20 8 50.8	5.212	1	10 18 27.75	2.0062	14 19 13.7	9.181
2	8 42 40.68	2.0748	20 3 35.3	5.305	2	10 20 28.09	2.0052	14 10 0.7	9.252
3	8 44 45.12	2.0732	19 58 14.2	5.397	3	10 22 28.38	2.0043	14 0 43.4	9.322
4	8 46 49.46	2.0715	19 52 47.6	5.489	4	10 24 28.61	2.0033	13 51 22.0	9.392
5	8 48 53.70	2.0698	19 47 15.5	5.582	5	10 26 28.78	2.0024	13 41 56.4	9.462
6	8 50 57.84	2.0682	19 41 37.8	5.673	6	10 28 28.90	2.0016	13 32 26.6	9.531
7	8 53 1.88	2.0665	19 35 54.7	5.763	7	10 30 28.97	2.0007	13 22 52.7	9.598
8	8 55 5.82	2.0648	19 30 6.2	5.853	8	10 32 28.99	2.0000	13 13 14.8	9.666
9	8 57 9.66	2.0632	19 24 12.3	5.943	9	10 34 28.97	1.9992	13 3 32.8	9.733
10	8 59 13.40	2.0615	19 18 13.0	6.033	10	10 36 28.89	1.9983	12 53 46.8	9.800
11	9 1 17.04	2.0598	19 12 8.3	6.122	11	10 38 28.77	1.9977	12 43 56.8	9.866
12	9 3 20.58	2.0582	19 5 58.3	6.211	12	10 40 28.61	1.9970	12 34 2.9	9.932
13	9 5 24.02	2.0566	18 59 43.0	6.300	13	10 42 28.41	1.9963	12 24 5.0	9.997
14	9 7 27.37	2.0550	18 53 22.3	6.388	14	10 44 28.17	1.9957	12 14 3.3	10.060
15	9 9 30.62	2.0533	18 46 56.4	6.475	15	10 46 27.89	1.9952	12 3 57.8	10.124
16	9 11 33.77	2.0517	18 40 25.3	6.562	16	10 48 27.59	1.9947	11 53 48.4	10.188
17	9 13 36.82	2.0500	18 33 48.9	6.650	17	10 50 27.25	1.9941	11 43 35.2	10.251
18	9 15 39.77	2.0484	18 27 7.3	6.736	18	10 52 26.88	1.9936	11 33 18.3	10.312
19	9 17 42.63	2.0468	18 20 20.6	6.821	19	10 54 26.48	1.9932	11 22 57.8	10.372
20	9 19 45.39	2.0452	18 13 28.8	6.907	20	10 56 26.06	1.9928	11 12 33.6	10.434
21	9 21 48.06	2.0437	18 6 31.8	6.992	21	10 58 25.62	1.9925	11 2 5.7	10.495
22	9 23 50.64	2.0422	17 59 29.8	7.076	22	11 0 25.16	1.9922	10 51 34.2	10.554
23	9 25 53.12	2.0405	N.17 52 22.7	7.161	23	11 2 24.68	1.9919	N.10 40 59.2	10.612
WEDNESDAY 30.					FRIDAY, NOVEMBER 1.				
0	9 27 55.50	2.0389	N.17 45 10.5	7.245	0	11 4 24.19	1.9917	N.10 30 20.7	10.671
1	9 29 57.79	2.0374	17 37 53.3	7.327	PHASES OF THE MOON.				
2	9 31 59.99	2.0359	17 30 31.2	7.409					
3	9 34 2.10	2.0344	17 23 4.2	7.492					
4	9 36 4.12	2.0329	17 15 32.2	7.574					
5	9 38 6.05	2.0314	17 7 55.3	7.655	<div><div>●</div>New Moon . . . . . Oct. 6 22 20.6</div> <div><div>☾</div>First Quarter . . . . . 13 22 2.0</div> <div><div>○</div>Full Moon . . . . . 20 21 16.5</div> <div><div>☾</div>Last Quarter . . . . . 28 19 51.5</div>				
6	9 40 7.89	2.0300	17 0 13.6	7.736					
7	9 42 9.65	2.0286	16 52 27.0	7.817					
8	9 44 11.32	2.0271	16 44 35.6	7.897					
9	9 46 12.90	2.0257	16 36 39.4	7.976	<div><div>☾</div>Perigee . . . . . Oct. 14 2.3</div> <div><div>☾</div>Apogee . . . . . 27 21.2</div>				
10	9 48 14.40	2.0243	16 28 38.5	8.055					
11	9 50 15.82	2.0230	16 20 32.8	8.134					
12	9 52 17.16	2.0217	16 12 22.4	8.212					
13	9 54 18.42	2.0202	16 4 7.4	8.289					
14	9 56 19.59	2.0189	15 55 47.7	8.367					
15	9 58 20.69	2.0177	15 47 23.4	8.443					
16	10 0 21.71	2.0164	15 38 54.6	8.518					
17	10 2 22.66	2.0152	15 30 21.2	8.595					
18	10 4 23.54	2.0140	15 21 43.2	8.670					
19	10 6 24.34	2.0128	15 13 0.8	8.744					
20	10 8 25.08	2.0117	15 4 13.9	8.818					
21	10 10 25.74	2.0105	14 55 22.6	8.892					
22	10 12 26.34	2.0094	14 46 26.9	8.965					
23	10 14 26.87	2.0083	14 37 26.8	9.037					
24	10 16 27.34	2.0073	N.14 28 22.4	9.109					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	$\alpha$ Arietis	W.	82 34 36	3199	84 0 46	3194	85 27 2	3188	86 53 25	3183
	Aldebaran	W.	50 47 12	3055	52 16 17	3050	53 45 27	3045	55 14 44	3040
	SUN	E.	68 10 54	3446	66 49 29	3441	65 27 59	3436	64 6 24	3431
2	$\alpha$ Arietis	W.	94 7 8	3151	95 34 16	3144	97 1 32	3137	98 28 56	3130
	Aldebaran	W.	62 42 59	3007	64 13 3	3000	65 43 16	2992	67 13 40	2983
	SUN	E.	57 16 50	3400	55 54 33	3392	54 32 7	3384	53 9 33	3376
3	$\alpha$ Arietis	W.	105 48 9	3094	107 16 27	3087	108 44 53	3079	110 13 28	3072
	Aldebaran	W.	74 48 24	2937	76 19 56	2927	77 51 41	2917	79 23 38	2906
	SUN	E.	46 14 17	3333	44 50 43	3324	43 26 59	3314	42 3 4	3305
9	SUN	W.	26 23 43	2825	27 57 39	2810	29 31 54	2796	31 6 27	2783
	MARS	E.	76 55 7	2604	75 16 17	2596	73 37 17	2589	71 58 7	2582
	Fomalhaut	E.	111 43 20	2661	110 5 48	2649	108 27 59	2638	106 49 55	2626
10	SUN	W.	39 3 2	2732	40 38 59	2724	42 15 7	2716	43 51 25	2709
	MARS	E.	63 40 6	2553	62 0 6	2548	60 19 59	2543	58 39 45	2538
	Fomalhaut	E.	98 36 11	2583	96 56 52	2576	95 17 24	2570	93 37 47	2564
	$\alpha$ Pegasi	E.	114 4 36	2838	112 30 58	2822	110 56 59	2807	109 22 40	2792
	SATURN	E.	117 34 6	2353	115 49 23	2347	114 4 32	2342	112 19 34	2337
11	SUN	W.	51 55 6	2680	53 32 12	2675	55 9 25	2670	56 46 45	2666
	MARS	E.	50 17 3	2518	48 36 15	2515	46 55 22	2512	45 14 25	2509
	Fomalhaut	E.	85 18 4	2545	83 37 53	2543	81 57 40	2541	80 17 24	2540
	$\alpha$ Pegasi	E.	101 26 54	2739	99 51 6	2731	98 15 7	2724	96 38 59	2718
	SATURN	E.	103 33 7	2317	101 47 32	2313	100 1 52	2310	98 16 7	2307
12	SUN	W.	64 54 39	2649	66 32 27	2647	68 10 18	2644	69 48 13	2642
	MARS	E.	36 48 45	2498	35 7 29	2496	33 26 10	2495	31 44 49	2494
	Fomalhaut	E.	71 56 4	2545	70 15 54	2549	68 35 48	2553	66 55 48	2557
	$\alpha$ Pegasi	E.	88 36 44	2702	87 0 6	2701	85 23 27	2701	83 46 48	2701
	SATURN	E.	89 26 22	2294	87 40 14	2292	85 54 4	2290	84 7 50	2289
13	SUN	W.	77 58 31	2633	79 36 41	2632	81 14 53	2630	82 53 7	2629
	Antares	W.	29 1 20	2465	30 43 22	2449	32 25 47	2434	34 8 33	2422
	Fomalhaut	E.	58 37 48	2596	56 58 46	2607	55 20 0	2619	53 41 30	2633
	SATURN	E.	75 16 8	2282	73 29 42	2281	71 43 15	2280	69 56 46	2280
	$\alpha$ Pegasi	E.	75 44 12	2719	74 7 57	2726	72 31 52	2733	70 55 56	2742
	$\alpha$ Arietis	E.	118 42 31	2487	117 1 0	2480	115 19 19	2474	113 37 29	2469
14	SUN	W.	91 4 29	2627	92 42 47	2628	94 21 4	2628	95 59 21	2628
	Antares	W.	42 46 10	2380	44 30 14	2375	46 14 25	2370	47 58 43	2366
	Fomalhaut	E.	45 34 43	2736	43 58 50	2766	42 23 37	2799	40 49 7	2836
	SATURN	E.	61 4 13	2279	59 17 42	2279	57 31 11	2279	55 44 40	2279
	$\alpha$ Pegasi	E.	62 59 43	2805	61 25 22	2822	59 51 23	2842	58 17 50	2864
	$\alpha$ Arietis	E.	105 6 41	2450	103 24 17	2447	101 41 49	2445	99 59 19	2443
15	SUN	W.	104 10 39	2632	105 48 50	2633	107 27 0	2635	109 5 8	2636
	Antares	W.	56 41 24	2354	58 26 5	2353	60 10 48	2352	61 55 32	2351
	SATURN	E.	46 52 19	2284	45 5 56	2285	43 19 34	2286	41 33 14	2288
	$\alpha$ Pegasi	E.	50 38 3	3012	49 8 5	3053	47 38 58	3098	46 10 46	3148

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	α Arietis W.	88 19 55	3177	89 46 32	3171	91 13 16	3164	92 40 8	3158
	Aldebaran W.	56 44 8	3034	58 13 39	3028	59 43 17	3021	61 13 4	3014
	SUN E.	62 44 43	3425	61 22 55	3419	60 1 1	3413	58 38 59	3407
2	α Arietis W.	99 56 29	3123	101 24 11	3116	102 52 1	3108	104 20 1	3101
	Aldebaran W.	68 44 14	2974	70 14 59	2965	71 45 55	2956	73 17 3	2946
	SUN E.	51 46 49	3368	50 23 56	3359	49 0 53	3351	47 37 40	3342
3	α Arietis W.	111 42 12	3065	113 11 4	3058	114 40 5	3051	116 9 15	3044
	Aldebaran W.	80 55 49	2895	82 28 13	2884	84 0 52	2873	85 33 45	2862
	SUN E.	40 38 58	3295	39 14 41	3286	37 50 14	3277	36 25 36	3268
9	SUN W.	32 41 17	2771	34 16 23	2760	35 51 43	2750	37 27 16	2741
	MARS E.	70 18 47	2576	68 39 19	2570	66 59 43	2564	65 19 58	2559
	Fomalhaut E.	105 11 36	2616	103 33 3	2607	101 54 18	2598	100 15 20	2590
10	SUN W.	45 27 53	2703	47 4 29	2697	48 41 13	2691	50 18 6	2684
	MARS E.	56 59 24	2534	55 18 57	2530	53 38 25	2525	51 57 47	2521
	Fomalhaut E.	91 58 3	2559	90 18 12	2555	88 38 14	2551	86 58 11	2548
	α Pegasi E.	107 48 2	2779	106 13 7	2767	104 37 56	2756	103 2 31	2747
	SATURN E.	110 34 29	2333	108 49 18	2328	107 4 0	2324	105 18 36	2321
11	SUN W.	58 24 10	2663	60 1 40	2659	61 39 15	2655	63 16 55	2652
	MARS E.	43 33 24	2506	41 52 19	2504	40 11 11	2501	38 29 59	2499
	Fomalhaut E.	78 37 7	2540	76 56 49	2541	75 16 33	2542	73 36 17	2543
	α Pegasi E.	95 2 43	2713	93 26 21	2709	91 49 53	2705	90 13 20	2703
	SATURN E.	96 30 18	2304	94 44 25	2302	92 58 28	2299	91 12 27	2296
12	SUN W.	71 26 12	2640	73 4 13	2638	74 42 16	2636	76 20 22	2634
	MARS E.	30 3 27	2493	28 22 4	2492	26 40 40	2492	24 59 16	2493
	Fomalhaut E.	65 15 54	2562	63 36 7	2569	61 56 30	2577	60 17 3	2586
	α Pegasi E.	82 10 10	2703	80 33 34	2706	78 57 2	2709	77 20 34	2713
	SATURN E.	82 21 34	2287	80 35 16	2285	78 48 55	2284	77 2 32	2283
13	SUN W.	84 31 22	2629	86 9 38	2629	87 47 54	2628	89 26 11	2627
	Antares W.	35 51 37	2411	37 34 57	2402	39 18 30	2394	41 2 15	2387
	Fomalhaut E.	52 3 20	2649	50 25 32	2667	48 48 7	2687	47 11 10	2710
	SATURN E.	68 10 17	2279	66 23 47	2279	64 37 16	2279	62 50 45	2278
	α Pegasi E.	69 20 12	2752	67 44 41	2765	66 9 24	2776	64 34 24	2790
	α Arietis E.	111 55 32	2464	110 13 28	2459	108 31 17	2456	106 49 1	2453
14	SUN W.	97 37 39	2628	99 15 56	2629	100 54 11	2630	102 32 26	2631
	Antares W.	49 43 7	2363	51 27 35	2360	53 12 8	2357	54 56 45	2355
	Fomalhaut E.	39 15 26	2879	37 42 40	2929	36 10 58	2986	34 40 27	3049
	SATURN E.	53 58 10	2280	52 11 41	2280	50 25 12	2281	48 38 45	2282
	α Pegasi E.	56 44 45	2888	55 12 11	2914	53 40 10	2943	52 8 46	2976
	α Arietis E.	98 16 46	2443	96 34 12	2443	94 51 38	2442	93 9 3	2442
15	SUN W.	110 43 14	2638	112 21 17	2640	113 59 17	2643	115 37 14	2646
	Antares W.	63 40 17	2351	65 25 2	2352	67 9 46	2352	68 54 30	2353
	SATURN E.	39 46 57	2290	38 0 43	2292	36 14 32	2295	34 28 25	2298
	α Pegasi E.	44 43 35	3204	43 17 31	3268	41 52 42	3338	40 29 15	3417

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## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
15	$\alpha$ Arietis E.	91 26 28	2443	89 43 54	2443	88 1 21	2445	86 18 50	2447
16	SUN W.	117 15 7	2649	118 52 57	2652	120 30 42	2655	122 8 23	2659
	Antares W.	70 39 13	2354	72 23 54	2355	74 8 33	2357	75 53 10	2359
	MARS W.	17 32 5	2513	19 13 0	2513	20 53 55	2514	22 34 49	2515
	SATURN E.	32 42 21	2301	30 56 21	2304	29 10 27	2308	27 24 38	2312
	$\alpha$ Arietis E.	77 47 9	2462	76 5 3	2467	74 23 4	2472	72 41 12	2478
	Aldebaran E.	108 52 38	2313	107 6 57	2315	105 21 19	2317	103 35 44	2320
17	Antares W.	84 35 26	2373	86 19 40	2376	88 3 49	2380	89 47 53	2384
	MARS W.	30 58 49	2526	32 39 26	2529	34 19 59	2533	36 0 26	2537
	$\alpha$ Arietis E.	64 14 6	2515	62 33 14	2525	60 52 36	2536	59 12 13	2548
	Aldebaran E.	94 48 52	2335	93 3 44	2339	91 18 42	2343	89 33 45	2348
18	Antares W.	98 26 29	2410	100 9 49	2417	101 53 0	2423	103 36 2	2430
	$\alpha$ Aquilæ W.	56 4 9	3346	57 27 27	3344	58 51 22	3287	60 15 49	3263
	MARS W.	44 21 9	2562	46 0 56	2568	47 40 35	2574	49 20 5	2580
	$\alpha$ Arietis E.	50 54 44	2622	49 16 19	2642	47 38 20	2663	46 0 50	2686
	Aldebaran E.	80 50 42	2373	79 6 28	2378	77 22 22	2384	75 38 25	2391
19	$\alpha$ Aquilæ W.	67 24 10	3181	68 50 43	3171	70 17 27	3163	71 44 21	3158
	MARS W.	57 35 17	2618	59 13 48	2626	60 52 8	2634	62 30 17	2643
	Aldebaran E.	67 1 3	2426	65 18 6	2434	63 35 20	2442	61 52 46	2450
	Pollux E.	111 7 54	2453	109 25 34	2460	107 43 24	2467	106 1 25	2475
20	$\alpha$ Aquilæ W.	78 59 53	3153	80 26 59	3156	81 54 1	3161	83 20 58	3167
	MARS W.	70 37 57	2691	72 14 49	2701	73 51 28	2711	75 27 53	2722
	Fomalhaut W.	44 3 58	2933	45 35 35	2917	47 7 33	2905	48 39 46	2896
	SATURN W.	23 12 57	2490	24 54 24	2499	26 35 39	2507	28 16 42	2516
	Aldebaran E.	53 23 1	2497	51 41 44	2507	50 0 41	2517	48 19 52	2528
	Pollux E.	97 34 22	2519	95 53 35	2528	94 13 1	2538	92 32 41	2548
	JUPITER E.	116 1 0	2533	114 20 32	2543	112 40 18	2553	111 0 18	2563
21	$\alpha$ Aquilæ W.	90 33 27	3213	91 59 21	3226	93 24 59	3240	94 50 21	3255
	MARS W.	83 26 18	2779	85 1 13	2791	86 35 52	2803	88 10 16	2815
	Fomalhaut W.	56 23 0	2876	57 55 49	2877	59 28 38	2878	61 1 25	2880
	SATURN W.	36 38 44	2566	38 18 26	2577	39 57 53	2587	41 37 6	2598
	Aldebaran E.	39 59 35	2584	38 20 19	2596	36 41 19	2609	35 2 36	2622
	Pollux E.	84 14 37	2603	82 35 46	2614	80 57 10	2626	79 18 50	2638
	JUPITER E.	102 43 50	2616	101 5 17	2628	99 27 0	2639	97 48 58	2651
22	$\alpha$ Aquilæ W.	101 52 24	3345	103 15 43	3367	104 38 37	3390	106 1 6	3414
	MARS W.	95 58 12	2879	97 30 58	2892	99 3 27	2905	100 35 40	2918
	Fomalhaut W.	68 44 2	2908	70 16 10	2916	71 48 9	2924	73 19 58	2932
	$\alpha$ Pegasi W.	54 6 30	3284	55 31 0	3273	56 55 43	3264	58 20 37	3257
	SATURN W.	49 49 12	2657	51 26 49	2669	53 4 10	2681	54 41 15	2693
	Pollux E.	71 11 18	2700	69 34 38	2713	67 58 15	2726	66 22 9	2739
	JUPITER E.	89 42 49	2711	88 6 24	2723	86 30 15	2735	84 54 22	2748
23	MARS W.	108 12 34	2984	109 43 7	2997	111 13 24	3009	112 43 25	3022
	Fomalhaut W.	80 56 14	2981	82 26 51	2991	83 57 15	3002	85 27 25	3013
	$\alpha$ Pegasi W.	65 26 30	3246	66 51 46	3247	68 17 0	3249	69 42 12	3251

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## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
15	$\alpha$ Arietis E.	84 36 22	2450	82 53 58	2452	81 11 37	2455	79 29 21	2458
16	SUN W.	123 45 59	2663	125 23 29	2667	127 0 54	2671	128 38 13	2676
	Antares W.	77 37 45	2361	79 22 16	2364	81 6 43	2366	82 51 7	2369
	MARS W.	24 15 42	2516	25 56 33	2518	27 37 22	2520	29 18 7	2523
	SATURN E.	25 38 56	2317	23 53 21	2322	22 7 54	2328	20 22 36	2335
	$\alpha$ Arietis E.	70 59 27	2484	69 17 51	2491	67 36 25	2499	65 55 10	2507
	Aldebaran E.	101 50 13	2323	100 4 46	2326	98 19 24	2328	96 34 6	2331
17	Antares W.	91 31 50	2389	93 15 41	2394	94 59 24	2399	96 43 0	2404
	MARS W.	37 40 48	2541	39 21 4	2546	41 1 12	2551	42 41 14	2556
	$\alpha$ Arietis E.	57 32 6	2560	55 52 16	2573	54 12 44	2588	52 33 33	2604
	Aldebaran E.	87 48 55	2352	86 4 11	2357	84 19 34	2362	82 35 4	2367
18	Antares W.	105 18 54	2437	107 1 36	2445	108 44 7	2453	110 26 27	2460
	$\alpha$ Aquilæ W.	61 40 44	2341	63 6 5	2322	64 31 48	2305	65 57 51	2312
	MARS W.	50 59 27	2587	52 38 39	2594	54 17 42	2602	55 56 35	2610
	$\alpha$ Arietis E.	44 23 51	2711	42 47 26	2739	41 11 38	2770	39 36 31	2805
	Aldebaran E.	73 54 37	2398	72 10 59	2404	70 27 30	2411	68 44 11	2419
19	$\alpha$ Aquilæ W.	73 11 21	3154	74 38 27	3151	76 5 35	3150	77 32 44	3151
	MARS W.	64 8 14	2652	65 45 59	2661	67 23 31	2671	69 0 51	2681
	Aldebaran E.	60 10 23	2460	58 28 13	2469	56 46 16	2478	55 4 32	2487
	Pollux E.	104 19 37	2483	102 38 0	2492	100 56 35	2501	99 15 22	2510
20	$\alpha$ Aquilæ W.	84 47 47	3174	86 14 28	3182	87 40 59	3191	89 7 19	3201
	MARS W.	77 4 4	2733	78 40 0	2744	80 15 41	2756	81 51 7	2767
	Fomalhaut W.	50 12 10	2888	51 44 44	2883	53 17 26	2879	54 50 12	2877
	SATURN W.	29 57 33	2525	31 38 11	2535	33 18 36	2545	34 58 47	2555
	Aldebaran E.	46 39 18	2539	44 58 59	2550	43 18 56	2561	41 39 8	2572
	Pollux E.	90 52 35	2559	89 12 43	2569	87 33 6	2580	85 53 44	2591
	JUPITER E.	109 20 31	2573	107 40 59	2583	106 1 41	2594	104 22 38	2605
21	$\alpha$ Aquilæ W.	96 15 25	3271	97 40 10	3288	99 4 36	3306	100 28 41	3325
	MARS W.	89 44 24	2828	91 18 16	2841	92 51 50	2853	94 25 9	2866
	Fomalhaut W.	62 34 9	2884	64 6 47	2890	65 39 19	2895	67 11 44	2901
	SATURN W.	43 16 3	2610	44 54 44	2622	46 33 9	2634	48 11 18	2645
	Aldebaran E.	33 24 10	2635	31 46 2	2647	30 8 11	2660	28 30 38	2675
	Pollux E.	77 40 46	2650	76 2 59	2662	74 25 28	2675	72 48 15	2687
	JUPITER E.	96 11 12	2663	94 33 42	2675	92 56 29	2687	91 19 31	2699
22	$\alpha$ Aquilæ W.	107 23 7	3439	108 44 40	3465	110 5 44	3492	111 26 17	3521
	MARS W.	102 7 36	2931	103 39 16	2945	105 10 38	2958	106 41 44	2971
	Fomalhaut W.	74 51 37	2941	76 23 4	2950	77 54 20	2960	79 25 23	2970
	$\alpha$ Pegasi W.	59 45 39	3252	61 10 47	3248	62 35 59	3246	64 1 14	3245
	SATURN W.	56 18 4	2706	57 54 36	2718	59 30 52	2730	61 6 52	2743
	Pollux E.	64 46 21	2752	63 10 50	2766	61 35 37	2779	60 0 41	2792
	JUPITER E.	83 18 46	2760	81 43 26	2772	80 8 22	2785	78 33 34	2798
23	MARS W.	114 13 10	3035	115 42 39	3048	117 11 52	3060	118 40 50	3072
	Fomalhaut W.	86 57 22	3024	88 27 5	3036	89 56 32	3048	91 25 45	3059
	$\alpha$ Pegasi W.	71 7 21	3255	72 32 25	3260	73 57 24	3265	75 22 16	3271

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Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
23	SATURN W.	62 42 35	2755	64 18 2	2767	65 53 13	2779	67 28 8	2791
	Pollux E.	58 26 3	2806	56 51 43	2819	55 17 40	2833	53 43 55	2847
	JUPITER E.	76 59 3	2810	75 24 48	2822	73 50 49	2835	72 17 6	2847
	Regulus E.	94 10 16	2774	92 35 14	2787	91 0 29	2799	89 26 0	2811
24	Fomalhaut W.	92 54 45	3071	94 23 30	3084	95 51 58	3096	97 20 12	3108
	α Pegasi W.	76 47 1	3277	78 11 39	3284	79 36 9	3291	81 0 31	3298
	SATURN W.	75 18 51	2850	76 52 14	2862	78 25 22	2873	79 58 16	2883
	α Arietis W.	33 12 38	3368	34 35 31	3344	35 58 52	3322	37 22 38	3303
	Pollux E.	45 59 38	2916	44 27 40	2931	42 56 0	2945	41 24 38	2960
	JUPITER E.	64 32 24	2906	63 0 13	2917	61 28 16	2928	59 56 33	2939
	Regulus E.	81 37 29	2870	80 4 32	2882	78 31 50	2893	76 59 22	2904
25	Fomalhaut W.	104 37 37	3172	106 4 20	3184	107 30 48	3197	108 57 1	3210
	α Pegasi W.	88 0 2	3341	89 23 26	3351	90 46 38	3360	92 9 40	3369
	SATURN W.	87 39 24	2935	89 10 59	2944	90 42 22	2953	92 13 34	2962
	α Arietis W.	44 25 50	3248	45 51 2	3243	47 16 20	3239	48 41 43	3235
	JUPITER E.	52 21 22	2991	50 50 59	3001	49 20 47	3010	47 50 46	3019
	Regulus E.	69 20 27	2956	67 49 19	2965	66 18 23	2974	64 47 39	2983
	SUN E.	131 38 10	3350	130 14 56	3360	128 51 54	3369	127 29 2	3377
26	SATURN W.	99 46 52	3001	101 17 3	3008	102 47 5	3014	104 17 0	3020
	α Pegasi W.	99 2 3	3421	100 23 56	3431	101 45 37	3442	103 7 6	3453
	α Arietis W.	55 49 24	3228	57 15 0	3228	58 40 36	3227	60 6 13	3227
	Aldebaran W.	23 6 19	3037	24 35 46	3042	26 5 7	3046	27 34 23	3051
	JUPITER E.	40 23 22	3059	38 54 22	3066	37 25 31	3072	35 56 47	3078
	Regulus E.	57 16 36	3023	55 46 53	3030	54 17 18	3037	52 47 52	3043
	SUN E.	120 37 2	3416	119 15 4	3423	117 53 13	3429	116 31 30	3435
27	SATURN W.	111 44 53	3044	113 14 11	3047	114 43 25	3051	116 12 35	3054
	α Arietis W.	67 14 14	3228	68 39 50	3228	70 5 26	3228	71 31 2	3227
	Aldebaran W.	34 59 28	3068	36 28 17	3071	37 57 2	3073	39 25 45	3075
	JUPITER E.	28 34 55	3105	27 6 51	3108	25 38 51	3112	24 10 56	3115
	Regulus E.	45 22 25	3069	43 53 37	3073	42 24 55	3077	40 56 17	3080
	SUN E.	109 44 24	3458	108 23 14	3462	107 2 7	3465	105 41 4	3467
28	α Arietis W.	78 39 14	3222	80 4 56	3220	81 30 41	3218	82 56 29	3215
	Aldebaran W.	46 48 53	3078	48 17 30	3077	49 46 8	3076	51 14 47	3074
	SUN E.	98 56 16	3471	97 35 20	3471	96 14 24	3470	94 53 26	3468
29	α Arietis W.	90 6 19	3199	91 32 29	3195	92 58 45	3190	94 25 6	3185
	Aldebaran W.	58 38 49	3058	60 7 50	3053	61 36 57	3048	63 6 11	3043
	SUN E.	88 7 55	3451	86 46 37	3446	85 25 13	3441	84 3 43	3435
30	α Arietis W.	101 38 27	3157	103 5 28	3151	104 32 36	3144	105 59 52	3137
	Aldebaran W.	70 34 11	3008	72 4 14	3000	73 34 27	2991	75 4 51	2982
	Pollux W.	26 57 7	3125	28 24 46	3107	29 52 47	3089	31 21 10	3072
	SUN E.	77 14 22	3399	75 52 4	3390	74 29 36	3380	73 6 57	3371
31	Aldebaran W.	82 39 52	2930	84 11 33	2919	85 43 28	2907	87 15 38	2895
	Pollux W.	38 48 17	2991	40 18 41	2975	41 49 25	2960	43 20 28	2945
	SUN E.	66 10 47	3317	64 46 55	3304	63 22 48	3291	61 58 26	3278

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
23	SATURN W.	69 2 48	2803	70 37 12	2815	72 11 20	2827	73 45 13	2838
	Pollux E.	52 10 28	2861	50 37 19	2875	49 4 27	2889	47 31 54	2902
	JUPITER E.	70 43 39	2859	69 10 27	2871	67 37 31	2883	66 4 50	2894
	Regulus E.	87 51 47	2823	86 17 50	2835	84 44 8	2847	83 10 41	2859
24	Fomalhaut W.	98 48 12	3121	100 15 56	3133	101 43 25	3146	103 10 39	3159
	α Pegasi W.	82 24 45	3306	83 48 49	3315	85 12 43	3323	86 36 28	3332
	SATURN W.	81 30 57	2894	83 3 23	2905	84 35 36	2915	86 7 36	2925
	α Arietis W.	38 46 46	3288	40 11 12	3275	41 35 53	3265	43 0 46	3256
	Pollux E.	39 53 35	2975	38 22 51	2990	36 52 25	3005	35 22 18	3021
	JUPITER E.	58 25 4	2950	56 53 49	2961	55 22 47	2971	53 51 58	2981
	Regulus E.	75 27 8	2915	73 55 8	2926	72 23 22	2936	70 51 48	2946
25	Fomalhaut W.	110 22 58	3223	111 48 39	3236	113 14 5	3250	114 39 15	3264
	α Pegasi W.	93 32 32	3379	94 55 12	3390	96 17 40	3400	97 39 57	3410
	SATURN W.	93 44 34	2971	95 15 23	2979	96 46 2	2986	98 16 32	2994
	α Arietis W.	50 7 11	3232	51 32 42	3231	52 58 14	3230	54 23 48	3229
	JUPITER E.	46 20 57	3027	44 51 19	3035	43 21 50	3043	41 52 31	3051
	Regulus E.	63 17 5	2992	61 46 43	3001	60 16 31	3009	58 46 29	3016
	SUN E.	126 6 19	3386	124 43 46	3394	123 21 23	3401	121 59 8	3409
26	SATURN W.	105 46 47	3026	107 16 27	3031	108 46 1	3035	110 15 30	3040
	α Pegasi W.	104 28 23	3464	105 49 28	3476	107 10 19	3487	108 30 58	3499
	α Arietis W.	61 31 50	3228	62 57 26	3228	64 23 2	3228	65 48 38	3228
	Aldebaran W.	29 3 33	3055	30 32 38	3058	32 1 39	3062	33 30 35	3065
	JUPITER E.	34 28 11	3084	32 59 43	3090	31 31 21	3095	30 3 5	3100
	Regulus E.	51 18 33	3049	49 49 22	3055	48 20 17	3060	46 51 18	3065
	SUN E.	115 9 53	3441	113 48 23	3446	112 26 58	3450	111 5 39	3454
27	SATURN W.	117 41 41	3056	119 10 45	3057	120 39 48	3058	122 8 49	3060
	α Arietis W.	72 56 39	3227	74 22 16	3226	75 47 54	3225	77 13 33	3224
	Aldebaran W.	40 54 25	3077	42 23 3	3078	43 51 40	3078	45 20 16	3078
	JUPITER E.	22 43 5	3119	21 15 19	3122	19 47 36	3125	18 19 57	3128
	Regulus E.	39 27 43	3083	37 59 13	3085	36 30 45	3087	35 2 19	3089
	SUN E.	104 20 3	3469	102 59 5	3470	101 38 8	3471	100 17 12	3471
28	α Arietis W.	84 22 20	3212	85 48 14	3209	87 14 12	3206	88 40 14	3203
	Aldebaran W.	52 43 29	3072	54 12 13	3069	55 41 1	3065	57 9 53	3062
	SUN E.	93 32 26	3466	92 11 24	3463	90 50 18	3460	89 29 9	3456
29	α Arietis W.	95 51 34	3179	97 18 8	3174	98 44 48	3169	100 11 34	3163
	Aldebaran W.	64 35 31	3036	66 4 59	3030	67 34 34	3023	69 4 18	3016
	SUN E.	82 42 6	3429	81 20 22	3422	79 58 31	3415	78 36 31	3407
30	α Arietis W.	107 27 17	3131	108 54 49	3124	110 22 30	3117	111 50 20	3110
	Aldebaran W.	76 35 26	2972	78 6 13	2962	79 37 13	2952	81 8 26	2941
	Pollux W.	32 49 55	3055	34 19 0	3038	35 48 26	3022	37 18 12	3006
	SUN E.	71 44 7	3361	70 21 6	3350	68 57 52	3339	67 34 26	3328
31	Aldebaran W.	88 48 4	2883	90 20 45	2869	91 53 43	2856	93 26 58	2843
	Pollux W.	44 51 50	2929	46 23 32	2914	47 55 33	2898	49 27 54	2883
	SUN E.	60 33 50	3265	59 8 58	3252	57 43 51	3239	56 18 28	3225

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ' "	"	' "	s	m s	s
Frid.	1	14 22 8.23	9.767	S. 14 9 0.2	-48.62	16 8.93	66.79	16 18.72	0.089
Sat.	2	14 26 3.05	9.800	14 28 20.3	48.04	16 9.18	66.91	16 20.45	0.055
SUN.	3	14 29 58.68	9.834	14 47 26.6	47.46	16 9.43	67.02	16 21.38	0.021
Mon.	4	14 33 55.13	9.869	15 6 18.5	-46.86	16 9.67	67.14	16 21.48	0.013
Tues.	5	14 37 52.41	9.904	15 24 55.8	46.23	16 9.91	67.26	16 20.76	0.047
Wed.	6	14 41 50.51	9.939	15 43 17.8	45.59	16 10.15	67.38	16 19.21	0.082
Thur.	7	14 45 49.44	9.974	16 1 24.1	-44.93	16 10.39	67.50	16 16.84	0.116
Frid.	8	14 49 49.21	10.008	16 19 14.4	44.25	16 10.63	67.62	16 13.63	0.151
Sat.	9	14 53 49.81	10.042	16 36 48.2	43.55	16 10.87	67.73	16 9.60	0.185
SUN.	10	14 57 51.25	10.076	16 54 5.1	-42.83	16 11.11	67.85	16 4.73	0.220
Mon.	11	15 1 53.51	10.111	17 11 4.7	42.10	16 11.35	67.97	15 59.05	0.254
Tues.	12	15 5 56.60	10.146	17 27 46.6	41.36	16 11.58	68.09	15 52.53	0.289
Wed.	13	15 10 0.53	10.181	17 44 10.2	-40.59	16 11.81	68.21	15 45.18	0.324
Thur.	14	15 14 5.28	10.216	18 0 15.4	39.81	16 12.04	68.33	15 37.00	0.358
Frid.	15	15 18 10.87	10.250	18 16 1.6	39.02	16 12.26	68.45	15 28.00	0.392
Sat.	16	15 22 17.29	10.285	18 31 28.5	-38.21	16 12.48	68.58	15 18.17	0.427
SUN.	17	15 26 24.55	10.320	18 46 35.6	37.38	16 12.69	68.70	15 7.49	0.462
Mon.	18	15 30 32.63	10.354	19 1 22.7	36.53	16 12.90	68.81	14 56.00	0.496
Tues.	19	15 34 41.54	10.389	19 15 49.5	-35.67	16 13.11	68.93	14 43.66	0.531
Wed.	20	15 38 51.28	10.423	19 29 55.3	34.80	16 13.31	69.04	14 30.52	0.565
Thur.	21	15 43 1.85	10.457	19 43 40.1	33.92	16 13.50	69.15	14 16.55	0.599
Frid.	22	15 47 13.23	10.491	19 57 3.3	-33.02	16 13.69	69.26	14 1.75	0.633
Sat.	23	15 51 25.43	10.525	20 10 4.8	32.10	16 13.88	69.37	13 46.14	0.667
SUN.	24	15 55 38.44	10.559	20 22 44.1	31.17	16 14.06	69.47	13 29.74	0.700
Mon.	25	15 59 52.24	10.592	20 35 0.9	-30.22	16 14.24	69.58	13 12.55	0.733
Tues.	26	16 4 6.82	10.625	20 46 54.8	29.26	16 14.41	69.68	12 54.58	0.765
Wed.	27	16 8 22.17	10.657	20 58 25.4	28.29	16 14.58	69.79	12 35.84	0.797
Thur.	28	16 12 38.28	10.688	21 9 32.5	-27.30	16 14.75	69.89	12 16.33	0.829
Frid.	29	16 16 55.14	10.718	21 20 15.8	26.30	16 14.91	69.99	11 56.09	0.860
Sat.	30	16 21 12.72	10.747	21 30 34.9	25.29	16 15.07	70.08	11 35.13	0.889
SUN.	31	16 25 31.01	10.776	S. 21 40 29.5	-24.26	16 15.22	70.17	11 13.46	0.917

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0<sup>s</sup>.19 from the sidereal time.  
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.



## AT GREENWICH MEAN NOON.

Day of the Week	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Frid.	1	14 22 10.89	9.768	S. 14 9 13.6	-48.62	16 18.74	0.089	14 38 29.63
Sat.	2	14 26 5.72	9.801	14 28 33.5	48.04	16 20.46	0.055	14 42 26.18
SUN.	3	14 30 1.36	9.835	14 47 39.6	47.46	16 21.38	0.021	14 46 22.74
Mon.	4	14 33 57.82	9.869	15 6 31.4	-46.85	16 21.47	0.013	14 50 19.29
Tues.	5	14 37 55.11	9.904	15 25 8.3	46.22	16 20.74	0.047	14 54 15.85
Wed.	6	14 41 53.22	9.939	15 43 30.1	45.58	16 19.18	0.082	14 58 12.40
Thur.	7	14 45 52.16	9.974	16 1 36.2	-44.92	16 16.80	0.116	15 2 8.96
Frid.	8	14 49 51.93	10.008	16 19 26.3	44.24	16 13.58	0.151	15 6 5.51
Sat.	9	14 53 52.52	10.042	16 36 59.8	43.54	16 9.55	0.185	15 10 2.07
SUN.	10	14 57 53.95	10.076	16 54 16.5	-42.82	16 4.67	0.220	15 13 58.62
Mon.	11	15 1 56.20	10.111	17 11 15.8	42.10	15 58.98	0.254	15 17 55.18
Tues.	12	15 5 59.28	10.146	17 27 57.4	41.35	15 52.45	0.289	15 21 51.73
Wed.	13	15 10 3.20	10.181	17 44 20.7	-40.59	15 45.09	0.324	15 25 48.29
Thur.	14	15 14 7.94	10.215	18 0 25.6	39.80	15 36.90	0.358	15 29 44.84
Frid.	15	15 18 13.51	10.249	18 16 11.5	39.01	15 27.89	0.392	15 33 41.40
Sat.	16	15 22 19.91	10.284	18 31 38.1	-38.19	15 18.05	0.427	15 37 37.96
SUN.	17	15 26 27.14	10.319	18 46 44.9	37.37	15 7.37	0.462	15 41 34.51
Mon.	18	15 30 35.20	10.353	19 1 31.7	36.52	14 55.87	0.496	15 45 31.07
Tues.	19	15 34 44.09	10.388	19 15 58.1	-35.67	14 43.53	0.531	15 49 27.62
Wed.	20	15 38 53.80	10.422	19 30 3.6	34.79	14 30.38	0.565	15 53 24.18
Thur.	21	15 43 4.34	10.456	19 43 48.1	33.90	14 16.40	0.599	15 57 20.74
Frid.	22	15 47 15.69	10.490	19 57 11.0	-33.00	14 1.60	0.633	16 1 17.29
Sat.	23	15 51 27.85	10.524	20 10 12.1	32.08	13 46.00	0.667	16 5 13.85
SUN.	24	15 55 40.82	10.557	20 22 51.0	31.15	13 29.58	0.700	16 9 10.40
Mon.	25	15 59 54.57	10.590	20 35 7.4	-30.20	13 12.39	0.733	16 13 6.96
Tues.	26	16 4 9.11	10.622	20 47 0.9	29.24	12 54.41	0.765	16 17 3.52
Wed.	27	16 8 24.41	10.654	20 58 31.2	28.27	12 35.67	0.797	16 21 0.08
Thur.	28	16 12 40.47	10.685	21 9 37.9	-27.29	12 16.16	0.829	16 24 56.63
Frid.	29	16 16 57.27	10.715	21 20 20.9	26.29	11 55.92	0.860	16 28 53.19
Sat.	30	16 21 14.79	10.745	21 30 39.6	25.28	11 34.96	0.889	16 32 49.75
SUN.	31	16 25 33.01	10.773	S. 21 40 33.9	-24.25	11 13.29	0.917	16 36 46.30

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,  
+ 9°.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	305	217 55 3.8	54 39.9	150.16	+ 0.13	9.996 6559	- 46.1	9 19 58.38
2	306	218 55 8.7	54 44.6	150.24	0.19	9.996 5455	45.9	9 16 2.47
3	307	219 55 15.6	54 51.4	150.33	0.22	9.996 4357	45.7	9 12 6.56
4	308	220 55 24.5	55 0.2	150.41	+ 0.20	9.996 3264	- 45.5	9 8 10.66
5	309	221 55 35.3	55 10.9	150.49	0.17	9.996 2175	45.3	9 4 14.75
6	310	222 55 48.0	55 23.4	150.56	0.11	9.996 1091	45.1	9 0 18.84
7	311	223 56 2.4	55 37.7	150.63	+ 0.04	9.996 0012	- 44.9	8 56 22.93
8	312	224 56 18.5	55 53.6	150.70	- 0.07	9.995 8938	44.6	8 52 27.02
9	313	225 56 36.1	56 11.2	150.77	0.20	9.995 7870	44.3	8 48 31.11
10	314	226 56 55.3	56 30.2	150.83	- 0.34	9.995 6810	- 43.9	8 44 35.20
11	315	227 57 15.9	56 50.7	150.89	0.48	9.995 5760	43.5	8 40 39.29
12	316	228 57 37.9	57 12.6	150.94	0.59	9.995 4721	43.0	8 36 43.38
13	317	229 58 1.3	57 35.8	151.00	- 0.70	9.995 3694	- 42.5	8 32 47.47
14	318	230 58 26.0	58 0.4	151.06	0.79	9.995 2682	41.8	8 28 51.56
15	319	231 58 52.1	58 26.3	151.12	0.85	9.995 1687	41.1	8 24 55.65
16	320	232 59 19.5	58 53.5	151.17	- 0.88	9.995 0709	- 40.3	8 20 59.74
17	321	233 59 48.3	59 22.2	151.23	0.88	9.994 9751	39.5	8 17 3.83
18	322	235 0 18.5	59 52.2	151.29	0.84	9.994 8812	38.7	8 13 7.92
19	323	236 0 50.2	0 23.8	151.35	- 0.78	9.994 7895	- 37.8	8 9 12.01
20	324	237 1 23.3	0 56.8	151.41	0.70	9.994 6998	36.9	8 5 16.10
21	325	238 1 58.0	1 31.3	151.47	0.60	9.994 6124	36.0	8 1 20.19
22	326	239 2 34.2	2 7.3	151.54	- 0.48	9.994 5271	- 35.1	7 57 24.28
23	327	240 3 11.9	2 44.9	151.61	0.34	9.994 4438	34.2	7 53 28.37
24	328	241 3 51.3	3 24.1	151.67	0.21	9.994 3627	33.4	7 49 32.46
25	329	242 4 32.2	4 4.9	151.74	- 0.10	9.994 2836	- 32.6	7 45 36.55
26	330	243 5 14.7	4 47.2	151.80	+ 0.02	9.994 2064	31.8	7 41 40.64
27	331	244 5 58.8	5 31.1	151.87	0.12	9.994 1312	31.0	7 37 44.73
28	332	245 6 44.5	6 16.6	151.93	+ 0.20	9.994 0578	- 30.2	7 33 48.82
29	333	246 7 31.6	7 3.6	152.00	0.27	9.993 9862	29.5	7 29 52.90
30	334	247 8 20.3	7 52.2	152.06	0.31	9.993 9163	28.8	7 25 56.99
31	335	248 9 10.5	8 42.2	152.12	+ 0.32	9.993 8480	- 28.2	7 22 1.08
NOTE.—The longitudes in the column $\lambda$ are referred to the true equinox of their own date, while those in the column $\lambda'$ are referred to the mean equinox of the beginning of the Besselian fictitious year.								
								Diff. for 1 Hour, — 9 <sup>h</sup> .8296. (Table II.)

GREENWICH MEAN TIME.									
Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	' "	' "	' "	"	' "	"	h m	m	d
1	15 11.4	15 16.9	55 38.9	+ 1.60	55 59.0	+ 1.73	21 4.4	1.89	25.1
2	15 22.7	15 28.8	56 20.4	1.82	56 42.6	1.87	21 50.2	1.93	26.1
3	15 34.9	15 41.2	57 5.4	1.89	57 28.1	1.88	22 37.1	2.00	27.1
4	15 47.2	15 53.0	57 50.4	+ 1.83	58 11.8	+ 1.73	23 26.3	2.10	28.1
5	15 58.5	16 3.5	58 31.8	1.60	58 50.1	1.43	6	.	29.1
6	16 7.9	16 11.6	59 6.2	1.24	59 19.9	1.03	0 18.2	2.23	0.6
7	16 14.6	16 16.8	59 30.9	+ 0.80	59 39.1	+ 0.56	1 13.4	2.37	1.6
8	16 18.3	16 19.0	59 44.5	+ 0.33	59 47.2	+ 0.11	2 11.8	2.49	2.6
9	16 19.0	16 18.3	59 47.2	- 0.10	59 44.7	- 0.29	3 12.3	2.54	3.6
10	16 17.1	16 15.3	59 40.1	- 0.47	59 33.5	- 0.61	4 13.2	2.52	4.6
11	16 13.1	16 10.5	59 25.4	0.74	59 15.8	0.85	5 12.7	2.43	5.6
12	16 7.6	16 4.4	59 5.2	0.93	58 53.6	0.99	6 9.4	2.30	6.6
13	16 1.1	15 57.7	58 41.4	- 1.04	58 28.7	- 1.08	7 2.9	2.16	7.6
14	15 54.1	15 50.4	58 15.5	1.11	58 2.1	1.13	7 53.4	2.05	8.6
15	15 46.7	15 42.9	57 48.3	1.15	57 34.4	1.17	8 41.6	1.97	9.6
16	15 39.0	15 35.1	57 20.3	- 1.18	57 5.9	- 1.20	9 28.5	1.93	10.6
17	15 31.2	15 27.2	56 51.5	1.20	56 37.0	1.21	10 14.9	1.93	11.6
18	15 23.3	15 19.3	56 22.4	1.21	56 7.8	1.21	11 1.4	1.95	12.6
19	15 15.3	15 11.5	55 53.3	- 1.20	55 39.1	- 1.17	11 48.6	1.99	13.6
20	15 7.7	15 4.1	55 25.2	1.13	55 11.9	1.08	12 36.8	2.03	14.6
21	15 0.6	14 57.4	54 59.3	1.01	54 47.7	0.93	13 25.9	2.06	15.6
22	14 54.5	14 52.0	54 37.1	- 0.83	54 27.9	- 0.71	14 15.5	2.06	16.6
23	14 49.9	14 48.2	54 20.1	0.58	54 14.0	0.43	15 5.0	2.05	17.6
24	14 47.1	14 46.6	54 9.9	- 0.26	54 7.8	- 0.08	15 53.6	2.00	18.6
25	14 46.6	14 47.2	54 7.9	+ 0.11	54 10.3	+ 0.30	16 41.1	1.95	19.6
26	14 48.6	14 50.6	54 15.2	0.51	54 22.7	0.73	17 27.2	1.90	20.6
27	14 53.3	14 56.8	54 32.7	0.94	54 45.3	1.16	18 12.2	1.86	21.6
28	15 0.9	15 5.7	55 0.4	+ 1.36	55 18.0	+ 1.56	18 56.4	1.85	22.6
29	15 11.1	15 17.1	55 37.8	1.75	55 59.8	1.91	19 40.8	1.86	23.6
30	15 23.6	15 30.5	56 23.6	2.05	56 48.9	2.15	20 26.2	1.92	24.6
31	15 37.6	15 45.0	57 15.3	+ 2.23	57 42.3	+ 2.26	21 13.4	2.02	25.6

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 1.					SUNDAY 3.				
0	11 4 24.19	1.9917	N. 10 30 20.7	10.671	0	12 40 35.14	2.0347	N. 1 4 15.2	12.617
1	11 6 23.68	1.9915	10 19 38.7	10.728	1	12 42 37.29	2.0368	0 51 37.6	12.636
2	11 8 23.17	1.9913	10 8 53.3	10.786	2	12 44 39.56	2.0390	0 38 58.9	12.655
3	11 10 22.64	1.9912	9 58 4.4	10.842	3	12 46 41.97	2.0413	0 26 19.0	12.673
4	11 12 22.11	1.9912	9 47 12.2	10.897	4	12 48 44.52	2.0437	0 13 38.1	12.689
5	11 14 21.58	1.9911	9 36 16.7	10.952	5	12 50 47.21	2.0460	N. 0 0 56.3	12.705
6	11 16 21.04	1.9911	9 25 17.9	11.007	6	12 52 50.04	2.0483	S. 0 11 46.5	12.721
7	11 18 20.51	1.9912	9 14 15.8	11.061	7	12 54 53.01	2.0508	0 24 30.2	12.734
8	11 20 19.99	1.9913	9 3 10.6	11.113	8	12 56 56.14	2.0534	0 37 14.6	12.747
9	11 22 19.47	1.9914	8 52 2.2	11.167	9	12 58 59.42	2.0560	0 49 59.8	12.759
10	11 24 18.96	1.9916	8 40 50.6	11.218	10	13 1 2.86	2.0586	1 2 45.7	12.770
11	11 26 18.46	1.9918	8 29 36.0	11.269	11	13 3 6.45	2.0612	1 15 32.2	12.779
12	11 28 17.98	1.9922	8 18 18.3	11.320	12	13 5 10.21	2.0640	1 28 19.2	12.787
13	11 30 17.52	1.9924	8 6 57.6	11.369	13	13 7 14.13	2.0668	1 41 6.7	12.795
14	11 32 17.07	1.9927	7 55 34.0	11.418	14	13 9 18.23	2.0697	1 53 54.6	12.801
15	11 34 16.65	1.9932	7 44 7.4	11.467	15	13 11 22.49	2.0725	2 6 42.8	12.806
16	11 36 16.26	1.9937	7 32 38.0	11.514	16	13 13 26.93	2.0755	2 19 31.3	12.810
17	11 38 15.90	1.9942	7 21 5.7	11.561	17	13 15 31.55	2.0785	2 32 20.0	12.813
18	11 40 15.57	1.9947	7 9 30.7	11.607	18	13 17 36.35	2.0816	2 45 8.9	12.816
19	11 42 15.27	1.9953	6 57 52.9	11.652	19	13 19 41.34	2.0847	2 57 57.9	12.817
20	11 44 15.01	1.9961	6 46 12.4	11.697	20	13 21 46.52	2.0879	3 10 46.9	12.816
21	11 46 14.80	1.9967	6 34 29.2	11.742	21	13 23 51.89	2.0911	3 23 35.8	12.813
22	11 48 14.62	1.9974	6 22 43.4	11.784	22	13 25 57.45	2.0943	3 36 24.5	12.811
23	11 50 14.49	1.9982	N. 6 10 55.1	11.827	23	13 28 3.21	2.0977	S. 3 49 13.1	12.807
SATURDAY 2.					MONDAY 4.				
0	11 52 14.41	1.9991	N. 5 59 4.2	11.868	0	13 30 9.17	2.1011	S. 4 2 1.4	12.802
1	11 54 14.38	2.0000	5 47 10.9	11.909	1	13 32 15.34	2.1045	4 14 49.3	12.795
2	11 56 14.41	2.0009	5 35 15.1	11.949	2	13 34 21.71	2.1079	4 27 36.8	12.787
3	11 58 14.49	2.0019	5 23 17.0	11.987	3	13 36 28.29	2.1115	4 40 23.8	12.779
4	12 0 14.64	2.0030	5 11 16.6	12.027	4	13 38 35.09	2.1152	4 53 10.3	12.769
5	12 2 14.85	2.0041	4 59 13.8	12.065	5	13 40 42.11	2.1187	5 5 56.1	12.757
6	12 4 15.13	2.0052	4 47 8.8	12.101	6	13 42 49.34	2.1224	5 18 41.2	12.745
7	12 6 15.48	2.0064	4 35 1.7	12.137	7	13 44 56.80	2.1262	5 31 25.5	12.731
8	12 8 15.90	2.0077	4 22 52.4	12.172	8	13 47 4.49	2.1300	5 44 8.9	12.716
9	12 10 16.40	2.0090	4 10 41.0	12.207	9	13 49 12.40	2.1338	5 56 51.4	12.700
10	12 12 16.98	2.0103	3 58 27.6	12.240	10	13 51 20.54	2.1377	6 9 32.9	12.682
11	12 14 17.64	2.0117	3 46 12.2	12.273	11	13 53 28.92	2.1417	6 22 13.2	12.662
12	12 16 18.38	2.0131	3 33 54.8	12.305	12	13 55 37.54	2.1457	6 34 52.4	12.642
13	12 18 19.21	2.0147	3 21 35.6	12.336	13	13 57 46.40	2.1497	6 47 30.3	12.621
14	12 20 20.14	2.0162	3 9 14.5	12.366	14	13 59 55.50	2.1537	7 0 6.9	12.598
15	12 22 21.16	2.0178	2 56 51.7	12.395	15	14 2 4.85	2.1579	7 12 42.1	12.574
16	12 24 22.28	2.0195	2 44 27.1	12.423	16	14 4 14.45	2.1621	7 25 15.8	12.548
17	12 26 23.50	2.0212	2 32 0.9	12.450	17	14 6 24.30	2.1662	7 37 47.9	12.522
18	12 28 24.82	2.0229	2 19 33.1	12.477	18	14 8 34.40	2.1705	7 50 18.4	12.493
19	12 30 26.25	2.0247	2 7 3.7	12.502	19	14 10 44.76	2.1748	8 2 47.1	12.463
20	12 32 27.79	2.0267	1 54 32.8	12.527	20	14 12 55.38	2.1792	8 15 14.0	12.432
21	12 34 29.45	2.0287	1 42 0.4	12.551	21	14 15 6.26	2.1836	8 27 39.0	12.400
22	12 36 31.23	2.0306	1 29 26.7	12.573	22	14 17 17.41	2.1881	8 40 2.0	12.366
23	12 38 33.12	2.0326	1 16 51.6	12.596	23	14 19 28.83	2.1925	8 52 22.9	12.331
24	12 40 35.14	2.0347	N. 1 4 15.2	12.617	24	14 21 40.51	2.1970	S. 9 4 41.7	12.294

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 5.					THURSDAY 7.				
0	14 21 40.51	2.1970	S. 9 4 41.7	12.294	0	16 12 51.01	2.4390	S. 17 44 23.1	8.781
1	14 23 52.47	2.2016	9 16 58.2	12.256	1	16 15 17.50	2.4440	17 53 6.7	8.671
2	14 26 4.70	2.2062	9 29 12.4	12.217	2	16 17 44.29	2.4490	18 1 43.6	8.559
3	14 28 17.21	2.2108	9 41 24.2	12.175	3	16 20 11.38	2.4538	18 10 13.8	8.447
4	14 30 30.00	2.2155	9 53 33.4	12.132	4	16 22 38.75	2.4586	18 18 37.2	8.332
5	14 32 43.07	2.2202	10 5 40.1	12.089	5	16 25 6.41	2.4633	18 26 53.7	8.217
6	14 34 56.42	2.2249	10 17 44.1	12.043	6	16 27 34.35	2.4681	18 35 3.3	8.102
7	14 37 10.06	2.2297	10 29 45.3	11.997	7	16 30 2.58	2.4728	18 43 5.9	7.983
8	14 39 23.99	2.2345	10 41 43.7	11.949	8	16 32 31.09	2.4774	18 51 1.3	7.863
9	14 41 38.20	2.2393	10 53 39.2	11.899	9	16 34 59.87	2.4820	18 58 49.5	7.742
10	14 43 52.71	2.2442	11 5 31.6	11.847	10	16 37 28.93	2.4866	19 6 30.4	7.621
11	14 46 7.51	2.2492	11 17 20.9	11.795	11	16 39 58.26	2.4910	19 14 4.0	7.497
12	14 48 22.61	2.2541	11 29 7.0	11.741	12	16 42 27.85	2.4954	19 21 30.1	7.372
13	14 50 38.00	2.2590	11 40 49.8	11.685	13	16 44 57.71	2.4998	19 28 48.7	7.247
14	14 52 53.69	2.2640	11 52 29.2	11.627	14	16 47 27.83	2.5042	19 35 59.7	7.120
15	14 55 9.68	2.2691	12 4 5.1	11.569	15	16 49 58.21	2.5084	19 43 3.1	6.992
16	14 57 25.98	2.2741	12 15 37.5	11.509	16	16 52 28.84	2.5125	19 49 58.7	6.862
17	14 59 42.57	2.2791	12 27 6.2	11.447	17	16 54 59.71	2.5166	19 56 46.5	6.731
18	15 1 59.47	2.2842	12 38 31.1	11.383	18	16 57 30.83	2.5207	20 3 26.4	6.599
19	15 4 16.68	2.2894	12 49 52.2	11.319	19	17 0 2.19	2.5247	20 9 58.4	6.467
20	15 6 34.20	2.2945	13 1 9.4	11.252	20	17 2 33.79	2.5286	20 16 22.4	6.332
21	15 8 52.02	2.2996	13 12 22.5	11.185	21	17 5 5.62	2.5323	20 22 38.3	6.197
22	15 11 10.15	2.3047	13 23 31.6	11.116	22	17 7 37.67	2.5360	20 28 46.1	6.062
23	15 13 28.59	2.3099	S. 13 34 36.4	11.045	23	17 10 9.94	2.5397	S. 20 34 45.7	5.924
WEDNESDAY 6.					FRIDAY 8.				
0	15 15 47.34	2.3151	S. 13 45 37.0	10.973	0	17 12 42.43	2.5432	S. 20 40 37.0	5.786
1	15 18 6.40	2.3203	13 56 33.2	10.898	1	17 15 15.13	2.5467	20 46 20.0	5.646
2	15 20 25.78	2.3256	14 7 24.8	10.823	2	17 17 48.04	2.5502	20 51 54.5	5.505
3	15 22 45.47	2.3307	14 18 11.9	10.747	3	17 20 21.15	2.5535	20 57 20.6	5.364
4	15 25 5.47	2.3359	14 28 54.4	10.668	4	17 22 54.46	2.5567	21 2 38.2	5.222
5	15 27 25.78	2.3412	14 39 32.1	10.587	5	17 25 27.95	2.5597	21 7 47.3	5.080
6	15 29 46.41	2.3464	14 50 4.9	10.506	6	17 28 1.63	2.5628	21 12 47.8	4.935
7	15 32 7.35	2.3516	15 0 32.8	10.422	7	17 30 35.49	2.5657	21 17 39.5	4.790
8	15 34 28.60	2.3568	15 10 55.6	10.338	8	17 33 9.52	2.5686	21 22 22.6	4.645
9	15 36 50.17	2.3622	15 21 13.4	10.252	9	17 35 43.72	2.5713	21 26 56.9	4.498
10	15 39 12.06	2.3674	15 31 25.9	10.164	10	17 38 18.08	2.5739	21 31 22.4	4.352
11	15 41 34.26	2.3726	15 41 33.1	10.075	11	17 40 52.59	2.5764	21 35 39.1	4.203
12	15 43 56.77	2.3777	15 51 34.9	9.984	12	17 43 27.25	2.5789	21 39 46.8	4.054
13	15 46 19.59	2.3830	16 1 31.2	9.892	13	17 46 2.06	2.5812	21 43 45.6	3.905
14	15 48 42.73	2.3882	16 11 22.0	9.799	14	17 48 37.00	2.5834	21 47 35.4	3.755
15	15 51 6.17	2.3933	16 21 7.1	9.703	15	17 51 12.07	2.5855	21 51 16.2	3.604
16	15 53 29.93	2.3986	16 30 46.4	9.607	16	17 53 47.26	2.5875	21 54 47.9	3.452
17	15 55 54.00	2.4037	16 40 19.9	9.508	17	17 56 22.57	2.5894	21 58 10.5	3.301
18	15 58 18.37	2.4087	16 49 47.4	9.408	18	17 58 57.99	2.5912	22 1 24.0	3.148
19	16 0 43.05	2.4139	16 59 8.9	9.307	19	18 1 33.52	2.5929	22 4 28.3	2.995
20	16 3 8.04	2.4190	17 8 24.3	9.205	20	18 4 9.14	2.5944	22 7 23.4	2.842
21	16 5 33.33	2.4240	17 17 33.5	9.102	21	18 6 44.85	2.5958	22 10 9.3	2.688
22	16 7 58.92	2.4291	17 26 36.5	8.996	22	18 9 20.64	2.5972	22 12 46.0	2.535
23	16 10 24.82	2.4341	17 35 33.0	8.888	23	18 11 56.51	2.5984	22 15 13.5	2.380
24	16 12 51.01	2.4390	S. 17 44 23.1	8.781	24	18 14 32.45	2.5995	S. 22 17 31.6	2.224

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 9.					MONDAY 11.				
0	18 14 32.45	2.5995	S. 22 17 31.6	2.224	0	20 18 21.66	2.5185	S. 21 6 12.1	5.046
1	18 17 8.45	2.6005	22 19 40.4	2.069	1	20 20 52.65	2.5144	21 1 5.2	5.182
2	18 19 44.51	2.6013	22 21 39.9	1.913	2	20 23 23.39	2.5103	20 55 50.2	5.317
3	18 22 20.61	2.6020	22 23 30.0	1.757	3	20 25 53.89	2.5066	20 50 27.1	5.452
4	18 24 56.75	2.6027	22 25 10.7	1.601	4	20 28 24.13	2.5019	20 44 56.0	5.585
5	18 27 32.93	2.6032	22 26 42.1	1.444	5	20 30 54.12	2.4977	20 39 16.9	5.718
6	18 30 9.14	2.6036	22 28 4.0	1.287	6	20 33 23.85	2.4933	20 33 29.8	5.850
7	18 32 45.36	2.6037	22 29 16.6	1.131	7	20 35 53.31	2.4888	20 27 34.9	5.980
8	18 35 21.59	2.6039	22 30 19.7	0.974	8	20 38 22.51	2.4844	20 21 32.2	6.109
9	18 37 57.83	2.6040	22 31 13.5	0.817	9	20 40 51.44	2.4799	20 15 21.8	6.237
10	18 40 34.07	2.6039	22 31 57.8	0.660	10	20 43 20.10	2.4755	20 9 3.8	6.364
11	18 43 10.30	2.6037	22 32 32.7	0.503	11	20 45 48.48	2.4707	20 2 38.1	6.491
12	18 45 46.51	2.6033	22 32 58.2	0.347	12	20 48 16.59	2.4662	19 56 4.9	6.615
13	18 48 22.70	2.6028	22 33 14.3	0.189	13	20 50 44.42	2.4614	19 49 24.3	6.738
14	18 50 58.85	2.6022	22 33 20.9	-0.032	14	20 53 11.96	2.4566	19 42 36.3	6.861
15	18 53 34.97	2.6016	22 33 18.2	+0.124	15	20 55 39.21	2.4518	19 35 41.0	6.982
16	18 56 11.04	2.6007	22 33 6.0	0.281	16	20 58 6.18	2.4471	19 28 38.4	7.103
17	18 58 47.05	2.5997	22 32 44.5	0.437	17	21 0 32.86	2.4422	19 21 28.6	7.222
18	19 1 23.01	2.5987	22 32 13.6	0.593	18	21 2 59.25	2.4374	19 14 11.8	7.338
19	19 3 58.90	2.5976	22 31 33.3	0.749	19	21 5 25.35	2.4325	19 6 48.0	7.455
20	19 6 34.72	2.5963	22 30 43.7	0.905	20	21 7 51.15	2.4275	18 59 17.2	7.571
21	19 9 10.46	2.5949	22 29 44.7	1.061	21	21 10 16.65	2.4226	18 51 39.5	7.685
22	19 11 46.11	2.5934	22 28 36.4	1.216	22	21 12 41.86	2.4176	18 43 55.0	7.797
23	19 14 21.67	2.5918	S. 22 27 18.8	1.370	23	21 15 6.76	2.4126	S. 18 36 3.8	7.909
SUNDAY 10.					TUESDAY 12.				
0	19 16 57.13	2.5901	S. 22 25 52.0	1.524	0	21 17 31.37	2.4076	S. 18 28 5.9	8.020
1	19 19 32.48	2.5882	22 24 15.9	1.678	1	21 19 55.67	2.4025	18 20 1.4	8.128
2	19 22 7.71	2.5862	22 22 30.6	1.832	2	21 22 19.67	2.3975	18 11 50.5	8.236
3	19 24 42.82	2.5842	22 20 36.1	1.985	3	21 24 43.37	2.3924	18 3 33.1	8.343
4	19 27 17.81	2.5821	22 18 32.4	2.137	4	21 27 6.76	2.3873	17 55 9.3	8.449
5	19 29 52.67	2.5797	22 16 19.6	2.289	5	21 29 29.85	2.3822	17 46 39.2	8.552
6	19 32 27.38	2.5772	22 13 57.7	2.441	6	21 31 52.63	2.3772	17 38 3.0	8.654
7	19 35 1.94	2.5748	22 11 26.7	2.592	7	21 34 15.11	2.3722	17 29 20.7	8.756
8	19 37 36.36	2.5722	22 8 46.7	2.742	8	21 36 37.29	2.3670	17 20 32.3	8.857
9	19 40 10.61	2.5695	22 5 57.7	2.892	9	21 38 59.15	2.3618	17 11 37.9	8.956
10	19 42 44.70	2.5667	22 2 59.7	3.040	10	21 41 20.71	2.3567	17 2 37.6	9.053
11	19 45 18.62	2.5639	21 59 52.9	3.188	11	21 43 41.96	2.3517	16 53 31.5	9.150
12	19 47 52.37	2.5609	21 56 37.1	3.337	12	21 46 2.91	2.3466	16 44 19.6	9.245
13	19 50 25.93	2.5578	21 53 12.5	3.483	13	21 48 23.55	2.3415	16 35 2.1	9.338
14	19 52 59.31	2.5547	21 49 39.1	3.630	14	21 50 43.89	2.3364	16 25 39.0	9.430
15	19 55 32.49	2.5514	21 45 56.9	3.775	15	21 53 3.92	2.3313	16 16 10.5	9.521
16	19 58 5.48	2.5481	21 42 6.1	3.919	16	21 55 23.65	2.3263	16 6 36.5	9.612
17	20 0 38.26	2.5447	21 38 6.6	4.063	17	21 57 43.08	2.3212	15 56 57.1	9.700
18	20 3 10.84	2.5412	21 33 58.5	4.206	18	22 0 2.20	2.3162	15 47 12.5	9.787
19	20 5 43.20	2.5376	21 29 41.9	4.348	19	22 2 21.03	2.3112	15 37 22.7	9.873
20	20 8 15.35	2.5339	21 25 16.7	4.490	20	22 4 39.55	2.3062	15 27 27.7	9.958
21	20 10 47.27	2.5302	21 20 43.1	4.630	21	22 6 57.77	2.3012	15 17 27.7	10.041
22	20 13 18.97	2.5263	21 16 1.1	4.770	22	22 9 15.70	2.2963	15 7 22.8	10.122
23	20 15 50.43	2.5224	21 11 10.7	4.908	23	22 11 33.33	2.2913	14 57 13.0	10.203
24	20 18 21.66	2.5185	S. 21 6 12.1	5.046	24	22 13 50.66	2.2864	S. 14 46 58.4	10.282

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 13.					FRIDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	22 13 50.66	2.2864	S. 14 46 58.4	10.282	0	23 58 38.09	2.0978	S. 5 26 9.6	12.613
1	22 16 7.70	2.2816	14 36 39.1	10.361	1	0 0 43.88	2.0932	5 13 32.2	12.632
2	22 18 24.45	2.2767	14 26 15.1	10.437	2	0 2 49.51	2.0925	5 0 53.7	12.651
3	22 20 40.90	2.2718	14 15 46.6	10.512	3	0 4 54.98	2.0899	4 48 14.1	12.668
4	22 22 57.07	2.2671	14 5 13.6	10.587	4	0 7 0.30	2.0874	4 35 33.5	12.684
5	22 25 12.95	2.2622	13 54 36.2	10.659	5	0 9 5.47	2.0850	4 22 52.0	12.699
6	22 27 28.54	2.2575	13 43 54.5	10.731	6	0 11 10.50	2.0826	4 10 9.6	12.713
7	22 29 43.85	2.2528	13 33 8.5	10.802	7	0 13 15.38	2.0802	3 57 26.4	12.726
8	22 31 58.88	2.2482	13 22 18.3	10.870	8	0 15 20.13	2.0780	3 44 42.5	12.737
9	22 34 13.63	2.2435	13 11 24.1	10.938	9	0 17 24.74	2.0757	3 31 57.9	12.748
10	22 36 28.10	2.2388	13 0 25.8	11.005	10	0 19 29.21	2.0735	3 19 12.7	12.757
11	22 38 42.29	2.2342	12 49 23.5	11.070	11	0 21 33.56	2.0715	3 6 27.0	12.765
12	22 40 56.21	2.2297	12 38 17.4	11.133	12	0 23 37.79	2.0694	2 53 40.8	12.773
13	22 43 9.86	2.2252	12 27 7.5	11.196	13	0 25 41.89	2.0674	2 40 54.2	12.779
14	22 45 23.24	2.2208	12 15 53.9	11.257	14	0 27 45.88	2.0655	2 28 7.3	12.784
15	22 47 36.36	2.2164	12 4 36.7	11.318	15	0 29 49.75	2.0636	2 15 20.1	12.788
16	22 49 49.21	2.2120	11 53 15.8	11.377	16	0 31 53.51	2.0617	2 2 32.7	12.792
17	22 52 1.80	2.2077	11 41 51.5	11.433	17	0 33 57.16	2.0600	1 49 45.1	12.793
18	22 54 14.13	2.2033	11 30 23.8	11.489	18	0 36 0.71	2.0583	1 36 57.5	12.794
19	22 56 26.20	2.1992	11 18 52.8	11.545	19	0 38 4.16	2.0567	1 24 9.8	12.794
20	22 58 38.03	2.1950	11 7 18.4	11.599	20	0 40 7.51	2.0551	1 11 22.2	12.793
21	23 0 49.60	2.1908	10 55 40.9	11.651	21	0 42 10.77	2.0535	0 58 34.6	12.792
22	23 3 0.92	2.1867	10 44 0.3	11.702	22	0 44 13.93	2.0520	0 45 47.2	12.788
23	23 5 12.00	2.1826	S. 10 32 16.6	11.752	23	0 46 17.01	2.0507	S. 0 33 0.1	12.783
THURSDAY 14.					SATURDAY 16.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	23 7 22.83	2.1785	S. 10 20 30.0	11.801	0	0 48 20.01	2.0492	S. 0 20 13.2	12.778
1	23 9 33.42	2.1746	10 8 40.5	11.848	1	0 50 22.92	2.0479	S. 0 7 26.7	12.772
2	23 11 43.78	2.1707	9 56 48.2	11.895	2	0 52 25.76	2.0467	N. 0 5 19.4	12.764
3	23 13 53.91	2.1669	9 44 53.1	11.941	3	0 54 28.52	2.0455	0 18 5.0	12.755
4	23 16 3.81	2.1630	9 32 55.3	11.984	4	0 56 31.22	2.0443	0 30 50.0	12.746
5	23 18 13.47	2.1592	9 20 55.0	12.027	5	0 58 33.84	2.0432	0 43 34.5	12.736
6	23 20 22.91	2.1555	9 8 52.1	12.068	6	1 0 36.40	2.0422	0 56 18.3	12.723
7	23 22 32.13	2.1519	8 56 46.8	12.108	7	1 2 38.90	2.0412	1 9 1.3	12.711
8	23 24 41.14	2.1482	8 44 39.1	12.148	8	1 4 41.35	2.0403	1 21 43.6	12.698
9	23 26 49.92	2.1447	8 32 29.0	12.187	9	1 6 43.74	2.0394	1 34 25.1	12.683
10	23 28 58.50	2.1412	8 20 16.7	12.222	10	1 8 46.08	2.0386	1 47 5.6	12.667
11	23 31 6.86	2.1377	8 8 2.3	12.257	11	1 10 48.37	2.0377	1 59 45.2	12.652
12	23 33 15.02	2.1343	7 55 45.8	12.292	12	1 12 50.61	2.0370	2 12 23.8	12.634
13	23 35 22.98	2.1310	7 43 27.3	12.325	13	1 14 52.81	2.0364	2 25 1.3	12.615
14	23 37 30.74	2.1277	7 31 6.8	12.357	14	1 16 54.98	2.0358	2 37 37.6	12.596
15	23 39 38.30	2.1244	7 18 44.4	12.388	15	1 18 57.11	2.0352	2 50 12.8	12.576
16	23 41 45.67	2.1212	7 6 20.2	12.417	16	1 20 59.21	2.0347	3 2 46.7	12.554
17	23 43 52.85	2.1181	6 53 54.3	12.446	17	1 23 1.28	2.0342	3 15 19.3	12.532
18	23 45 59.84	2.1150	6 41 26.7	12.474	18	1 25 3.32	2.0338	3 27 50.5	12.507
19	23 48 6.65	2.1120	6 28 57.5	12.500	19	1 27 5.34	2.0335	3 40 20.2	12.483
20	23 50 13.28	2.1091	6 16 26.7	12.526	20	1 29 7.34	2.0332	3 52 48.5	12.458
21	23 52 19.74	2.1062	6 3 54.4	12.549	21	1 31 9.32	2.0329	4 5 15.2	12.432
22	23 54 26.03	2.1033	5 51 26.8	12.572	22	1 33 11.29	2.0327	4 17 40.3	12.405
23	23 56 32.14	2.1005	5 38 45.8	12.593	23	1 35 13.24	2.0325	4 30 3.8	12.377
24	23 58 38.09	2.0978	S. 5 26 9.6	12.613	24	1 37 15.19	2.0324	N. 4 42 25.5	12.347

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 17.					TUESDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	1 37 15.19	2.0324	N. 4 42 25.5	12.347	0	3 15 26.20	2.0712	N. 13 44 6.6	9.889
1	1 39 17.13	2.0323	4 54 45.5	12.317	1	3 17 30.52	2.0727	13 53 57.8	9.817
2	1 41 19.07	2.0322	5 7 3.6	12.286	2	3 19 34.93	2.0742	14 3 44.6	9.744
3	1 43 21.00	2.0322	5 19 19.8	12.254	3	3 21 39.43	2.0757	14 13 27.1	9.672
4	1 45 22.94	2.0323	5 31 34.1	12.222	4	3 23 44.01	2.0772	14 23 5.2	9.598
5	1 47 24.88	2.0324	5 43 46.4	12.187	5	3 25 48.69	2.0787	14 32 38.9	9.523
6	1 49 26.83	2.0326	5 55 56.6	12.152	6	3 27 53.46	2.0803	14 42 8.0	9.447
7	1 51 28.79	2.0327	6 8 4.7	12.117	7	3 29 58.33	2.0818	14 51 32.5	9.371
8	1 53 30.76	2.0330	6 20 10.6	12.080	8	3 32 3.28	2.0833	15 0 52.5	9.295
9	1 55 32.75	2.0332	6 32 14.3	12.042	9	3 34 8.33	2.0849	15 10 7.9	9.217
10	1 57 34.75	2.0336	6 44 15.7	12.004	10	3 36 13.47	2.0865	15 19 18.6	9.138
11	1 59 36.78	2.0340	6 56 14.8	11.964	11	3 38 18.71	2.0881	15 28 24.5	9.059
12	2 1 38.83	2.0344	7 8 11.4	11.923	12	3 40 24.04	2.0897	15 37 25.7	8.980
13	2 3 40.91	2.0348	7 20 5.6	11.882	13	3 42 29.47	2.0912	15 46 22.1	8.899
14	2 5 43.01	2.0353	7 31 57.3	11.840	14	3 44 34.99	2.0928	15 55 13.6	8.818
15	2 7 45.15	2.0359	7 43 46.4	11.797	15	3 46 40.61	2.0944	16 4 0.3	8.737
16	2 9 47.32	2.0364	7 55 32.9	11.752	16	3 48 46.32	2.0960	16 12 42.0	8.653
17	2 11 49.52	2.0370	8 7 16.7	11.707	17	3 50 52.13	2.0976	16 21 18.7	8.571
18	2 13 51.76	2.0377	8 18 57.8	11.662	18	3 52 58.03	2.0992	16 29 50.5	8.487
19	2 15 54.04	2.0383	8 30 36.2	11.616	19	3 55 4.03	2.1007	16 38 17.2	8.402
20	2 17 56.36	2.0391	8 42 11.7	11.567	20	3 57 10.12	2.1023	16 46 38.8	8.317
21	2 19 58.73	2.0399	8 53 44.3	11.519	21	3 59 16.31	2.1039	16 54 55.3	8.232
22	2 22 1.15	2.0407	9 5 14.0	11.470	22	4 1 22.59	2.1055	17 3 6.6	8.145
23	2 24 3.61	2.0414	N. 9 16 40.7	11.420	23	4 3 28.97	2.1071	N. 17 11 12.7	8.058
MONDAY 18.					WEDNESDAY 20.				
0	2 26 6.12	2.0422	N. 9 28 4.4	11.369	0	4 5 35.44	2.1087	N. 17 19 13.6	7.971
1	2 28 8.68	2.0432	9 39 25.0	11.317	1	4 7 42.01	2.1102	17 27 9.2	7.882
2	2 30 11.30	2.0442	9 50 42.4	11.263	2	4 9 48.67	2.1118	17 34 59.5	7.794
3	2 32 13.98	2.0451	10 1 56.6	11.210	3	4 11 55.43	2.1134	17 42 44.5	7.705
4	2 34 16.71	2.0461	10 13 7.6	11.155	4	4 14 2.28	2.1149	17 50 24.1	7.614
5	2 36 19.51	2.0471	10 24 15.2	11.099	5	4 16 9.22	2.1164	17 57 58.2	7.523
6	2 38 22.36	2.0481	10 35 19.5	11.043	6	4 18 16.25	2.1180	18 5 26.9	7.433
7	2 40 25.28	2.0492	10 46 20.4	10.987	7	4 20 23.38	2.1195	18 12 50.2	7.342
8	2 42 28.27	2.0503	10 57 17.9	10.928	8	4 22 30.59	2.1209	18 20 7.9	7.248
9	2 44 31.32	2.0514	11 8 11.8	10.869	9	4 24 37.89	2.1224	18 27 20.0	7.156
10	2 46 34.44	2.0527	11 19 2.2	10.810	10	4 26 45.28	2.1239	18 34 26.6	7.062
11	2 48 37.64	2.0538	11 29 49.0	10.749	11	4 28 52.76	2.1254	18 41 27.5	6.968
12	2 50 40.90	2.0550	11 40 32.1	10.687	12	4 31 0.33	2.1268	18 48 22.8	6.874
13	2 52 44.24	2.0562	11 51 11.5	10.626	13	4 33 7.98	2.1282	18 55 12.4	6.779
14	2 54 47.65	2.0575	12 1 47.2	10.562	14	4 35 15.72	2.1297	19 1 56.3	6.683
15	2 56 51.14	2.0588	12 12 19.0	10.498	15	4 37 23.54	2.1310	19 8 34.4	6.587
16	2 58 54.71	2.0602	12 22 47.0	10.434	16	4 39 31.44	2.1323	19 15 6.8	6.491
17	3 0 58.36	2.0615	12 33 11.1	10.369	17	4 41 39.42	2.1337	19 21 33.3	6.393
18	3 3 2.09	2.0628	12 43 31.3	10.302	18	4 43 47.49	2.1351	19 27 54.0	6.297
19	3 5 5.90	2.0642	12 53 47.4	10.235	19	4 45 55.63	2.1363	19 34 8.9	6.199
20	3 7 9.79	2.0655	13 3 59.5	10.167	20	4 48 3.85	2.1377	19 40 17.9	6.101
21	3 9 13.76	2.0669	13 14 7.5	10.099	21	4 50 12.15	2.1389	19 46 21.0	6.002
22	3 11 17.82	2.0684	13 24 11.4	10.030	22	4 52 20.52	2.1401	19 52 18.1	5.902
23	3 13 21.97	2.0698	13 34 11.1	9.960	23	4 54 28.96	2.1413	19 58 9.2	5.802
24	3 15 26.20	2.0712	N. 13 44 6.6	9.889	24	4 56 37.48	2.1426	N. 20 3 54.4	5.703



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 21.					SATURDAY 23.				
0	4 56 37.48	2.1426	N.20 3 54.4	5.703	0	6 40 11.80	2.1582	N.22 36 49.0	0.604
1	4 58 46.07	2.1437	20 9 33.6	5.602	1	6 42 21.27	2.1575	22 37 22.0	0.497
2	5 0 54.72	2.1448	20 15 6.7	5.501	2	6 44 30.70	2.1568	22 37 48.6	0.389
3	5 3 3.45	2.1460	20 20 33.7	5.400	3	6 46 40.09	2.1561	22 38 8.7	0.281
4	5 5 12.24	2.1470	20 25 54.7	5.298	4	6 48 49.43	2.1552	22 38 22.3	0.172
5	5 7 21.09	2.1480	20 31 9.5	5.196	5	6 50 58.72	2.1544	22 38 29.4	+0.065
6	5 9 30.00	2.1491	20 36 18.2	5.094	6	6 53 7.96	2.1536	22 38 30.1	-0.042
7	5 11 38.98	2.1501	20 41 20.8	4.992	7	6 55 17.15	2.1527	22 38 24.4	0.149
8	5 13 48.01	2.1510	20 46 17.2	4.888	8	6 57 26.28	2.1517	22 38 12.2	0.257
9	5 15 57.10	2.1519	20 51 7.4	4.785	9	6 59 35.36	2.1507	22 37 53.5	0.365
10	5 18 6.24	2.1528	20 55 51.4	4.682	10	7 1 44.37	2.1497	22 37 28.4	0.472
11	5 20 15.44	2.1537	21 0 29.2	4.577	11	7 3 53.32	2.1487	22 36 56.9	0.578
12	5 22 24.68	2.1544	21 5 0.7	4.472	12	7 6 2.21	2.1476	22 36 19.0	0.685
13	5 24 33.97	2.1552	21 9 25.9	4.368	13	7 8 11.03	2.1464	22 35 34.7	0.792
14	5 26 43.31	2.1561	21 13 44.9	4.263	14	7 10 19.78	2.1452	22 34 44.0	0.898
15	5 28 52.70	2.1567	21 17 57.5	4.158	15	7 12 28.46	2.1440	22 33 46.9	1.004
16	5 31 2.12	2.1573	21 22 3.9	4.053	16	7 14 37.06	2.1427	22 32 43.5	1.110
17	5 33 11.58	2.1580	21 26 3.9	3.947	17	7 16 45.59	2.1415	22 31 33.7	1.216
18	5 35 21.08	2.1587	21 29 57.5	3.841	18	7 18 54.04	2.1402	22 30 17.6	1.321
19	5 37 30.62	2.1592	21 33 44.8	3.735	19	7 21 2.41	2.1388	22 28 55.2	1.426
20	5 39 40.19	2.1598	21 37 25.7	3.629	20	7 23 10.70	2.1374	22 27 26.5	1.532
21	5 41 49.79	2.1602	21 41 0.3	3.522	21	7 25 18.90	2.1360	22 25 51.4	1.637
22	5 43 59.42	2.1607	21 44 28.4	3.415	22	7 27 27.02	2.1346	22 24 10.1	1.741
23	5 46 9.07	2.1611	N.21 47 50.1	3.308	23	7 29 35.05	2.1331	N.22 22 22.5	1.845
FRIDAY 22.					SUNDAY 24.				
0	5 48 18.75	2.1615	N.21 51 5.4	3.202	0	7 31 42.99	2.1316	N.22 20 28.7	1.949
1	5 50 28.45	2.1618	21 54 14.3	3.094	1	7 33 50.84	2.1300	22 18 28.6	2.052
2	5 52 38.17	2.1621	21 57 16.7	2.987	2	7 35 58.59	2.1284	22 16 22.4	2.156
3	5 54 47.90	2.1623	22 0 12.7	2.880	3	7 38 6.25	2.1269	22 14 9.9	2.260
4	5 56 57.65	2.1626	22 3 2.3	2.772	4	7 40 13.82	2.1252	22 11 51.2	2.362
5	5 59 7.41	2.1627	22 5 45.3	2.663	5	7 42 21.28	2.1235	22 9 26.4	2.464
6	6 1 17.18	2.1629	22 8 21.9	2.556	6	7 44 28.64	2.1218	22 6 55.5	2.567
7	6 3 26.96	2.1630	22 10 52.0	2.447	7	7 46 35.90	2.1201	22 4 18.4	2.669
8	6 5 36.74	2.1631	22 13 15.6	2.339	8	7 48 43.05	2.1183	22 1 35.2	2.771
9	6 7 46.53	2.1631	22 15 32.7	2.232	9	7 50 50.10	2.1166	21 58 45.9	2.872
10	6 9 56.31	2.1630	22 17 43.4	2.123	10	7 52 57.04	2.1148	21 55 50.6	2.972
11	6 12 6.09	2.1630	22 19 47.5	2.014	11	7 55 3.88	2.1130	21 52 49.2	3.073
12	6 14 15.87	2.1629	22 21 45.1	1.906	12	7 57 10.60	2.1111	21 49 41.8	3.173
13	6 16 25.64	2.1627	22 23 36.2	1.797	13	7 59 17.21	2.1092	21 46 28.4	3.272
14	6 18 35.39	2.1624	22 25 20.8	1.689	14	8 1 23.71	2.1074	21 43 9.0	3.372
15	6 20 45.13	2.1622	22 26 58.9	1.581	15	8 3 30.10	2.1056	21 39 43.7	3.472
16	6 22 54.86	2.1620	22 28 30.5	1.472	16	8 5 36.38	2.1036	21 36 12.4	3.571
17	6 25 4.57	2.1617	22 29 55.6	1.364	17	8 7 42.53	2.1016	21 32 35.2	3.669
18	6 27 14.26	2.1612	22 31 14.2	1.255	18	8 9 48.57	2.0997	21 28 52.1	3.767
19	6 29 23.92	2.1608	22 32 26.2	1.147	19	8 11 54.49	2.0977	21 25 3.2	3.864
20	6 31 33.56	2.1604	22 33 31.8	1.039	20	8 14 0.29	2.0957	21 21 8.4	3.962
21	6 33 43.17	2.1599	22 34 30.9	0.930	21	8 16 5.98	2.0937	21 17 7.7	4.059
22	6 35 52.75	2.1593	22 35 23.4	0.822	22	8 18 11.54	2.0917	21 13 1.3	4.155
23	6 38 2.29	2.1587	22 36 9.5	0.713	23	8 20 16.98	2.0896	21 8 49.1	4.252
24	6 40 11.80	2.1582	N.22 36 49.0	0.604	24	8 22 22.29	2.0875	N.21 4 31.1	4.347

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 25.					WEDNESDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 22 22.29	2.0875	N. 21 4 31.1	4.347	0	10 0 9.62	1.9902	N. 15 54 4.0	8.407
1	8 24 27.48	2.0855	21 0 7.4	4.442	1	10 2 8.98	1.9885	15 45 37.4	8.479
2	8 26 32.55	2.0834	20 55 38.0	4.537	2	10 4 8.24	1.9868	15 37 6.5	8.552
3	8 28 37.49	2.0813	20 51 2.9	4.632	3	10 6 7.40	1.9852	15 28 31.2	8.623
4	8 30 42.31	2.0793	20 46 22.2	4.726	4	10 8 6.47	1.9837	15 19 51.7	8.694
5	8 32 47.00	2.0771	20 41 35.8	4.820	5	10 10 5.45	1.9822	15 11 7.9	8.765
6	8 34 51.56	2.0749	20 36 43.8	4.912	6	10 12 4.33	1.9806	15 2 19.9	8.835
7	8 36 55.99	2.0728	20 31 46.3	5.005	7	10 14 3.12	1.9792	14 53 27.7	8.904
8	8 39 0.30	2.0707	20 26 43.2	5.097	8	10 16 1.83	1.9777	14 44 31.4	8.973
9	8 41 4.48	2.0686	20 21 34.6	5.190	9	10 18 0.45	1.9762	14 35 30.9	9.042
10	8 43 8.53	2.0664	20 16 20.4	5.282	10	10 19 58.98	1.9748	14 26 26.3	9.110
11	8 45 12.45	2.0642	20 11 0.8	5.372	11	10 21 57.43	1.9735	14 17 17.7	9.177
12	8 47 16.24	2.0621	20 5 35.8	5.462	12	10 23 55.80	1.9722	14 8 5.1	9.244
13	8 49 19.90	2.0600	20 0 5.3	5.552	13	10 25 54.09	1.9709	13 58 48.4	9.311
14	8 51 23.44	2.0578	19 54 29.5	5.642	14	10 27 52.31	1.9697	13 49 27.8	9.376
15	8 53 26.84	2.0557	19 48 48.3	5.732	15	10 29 50.46	1.9685	13 40 3.3	9.442
16	8 55 30.12	2.0535	19 43 1.7	5.820	16	10 31 48.53	1.9673	13 30 34.8	9.507
17	8 57 33.26	2.0513	19 37 9.9	5.907	17	10 33 46.54	1.9662	13 21 2.4	9.572
18	8 59 36.28	2.0493	19 31 12.8	5.996	18	10 35 44.48	1.9651	13 11 26.2	9.635
19	9 1 39.17	2.0471	19 25 10.4	6.084	19	10 37 42.35	1.9640	13 1 46.2	9.698
20	9 3 41.93	2.0450	19 19 2.7	6.171	20	10 39 40.16	1.9630	12 52 2.4	9.761
21	9 5 44.57	2.0428	19 12 49.9	6.257	21	10 41 37.91	1.9620	12 42 14.9	9.823
22	9 7 47.07	2.0407	19 6 31.9	6.342	22	10 43 35.60	1.9611	12 32 23.6	9.885
23	9 9 49.45	2.0386	N. 19 0 8.8	6.427	23	10 45 33.24	1.9602	N. 12 22 28.7	9.946
TUESDAY 26.					THURSDAY 28.				
0	9 11 51.70	2.0364	N. 18 53 40.6	6.512	0	10 47 30.82	1.9593	N. 12 12 30.1	10.007
1	9 13 53.82	2.0343	18 47 7.3	6.597	1	10 49 28.35	1.9585	12 2 27.9	10.067
2	9 15 55.82	2.0323	18 40 28.9	6.682	2	10 51 25.84	1.9577	11 52 22.1	10.127
3	9 17 57.70	2.0302	18 33 45.5	6.765	3	10 53 23.28	1.9571	11 42 12.7	10.186
4	9 19 59.45	2.0281	18 26 57.1	6.848	4	10 55 20.69	1.9564	11 31 59.8	10.244
5	9 22 1.07	2.0260	18 20 3.7	6.931	5	10 57 18.05	1.9557	11 21 43.4	10.302
6	9 24 2.57	2.0240	18 13 5.4	7.013	6	10 59 15.37	1.9551	11 11 23.6	10.358
7	9 26 3.95	2.0220	18 6 2.1	7.095	7	11 1 12.66	1.9546	11 1 0.4	10.416
8	9 28 5.21	2.0200	17 58 54.0	7.176	8	11 3 9.92	1.9542	10 50 33.7	10.472
9	9 30 6.35	2.0180	17 51 41.0	7.256	9	11 5 7.16	1.9537	10 40 3.7	10.527
10	9 32 7.37	2.0159	17 44 23.3	7.336	10	11 7 4.37	1.9532	10 29 30.4	10.582
11	9 34 8.26	2.0139	17 37 0.7	7.417	11	11 9 1.55	1.9529	10 18 53.8	10.637
12	9 36 9.04	2.0120	17 29 33.3	7.496	12	11 10 58.72	1.9527	10 8 14.0	10.691
13	9 38 9.70	2.0101	17 22 1.2	7.574	13	11 12 55.87	1.9523	9 57 30.9	10.744
14	9 40 10.25	2.0082	17 14 24.4	7.652	14	11 14 53.00	1.9522	9 46 44.7	10.797
15	9 42 10.68	2.0062	17 6 42.9	7.730	15	11 16 50.13	1.9521	9 35 55.3	10.850
16	9 44 10.99	2.0043	16 58 56.8	7.807	16	11 18 47.25	1.9519	9 25 2.7	10.902
17	9 46 11.20	2.0026	16 51 6.0	7.884	17	11 20 44.36	1.9518	9 14 7.1	10.952
18	9 48 11.30	2.0007	16 43 10.7	7.960	18	11 22 41.47	1.9518	9 3 8.5	11.002
19	9 50 11.28	1.9988	16 35 10.8	8.036	19	11 24 38.58	1.9519	8 52 6.8	11.052
20	9 52 11.16	1.9971	16 27 6.4	8.111	20	11 26 35.70	1.9520	8 41 2.2	11.102
21	9 54 10.93	1.9953	16 18 57.5	8.186	21	11 28 32.82	1.9521	8 29 54.6	11.150
22	9 56 10.60	1.9936	16 10 44.1	8.261	22	11 30 29.95	1.9523	8 18 44.2	11.197
23	9 58 10.16	1.9918	16 2 26.2	8.334	23	11 32 27.10	1.9526	8 7 30.9	11.246
24	10 0 9.62	1.9902	N. 15 54 4.0	8.407	24	11 34 24.26	1.9529	N. 7 56 14.7	11.292

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 29.					SUNDAY, DECEMBER 1.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	11 34 24.26	1.9529	N. 7 56 14.7	11.292	13	9 36.32	2.0375	S. 1 46 45.6	12.703
2	11 36 21.45	1.9533	7 44 55.8	11.338	PHASES OF THE MOON.				
3	11 38 18.66	1.9537	7 33 34.1	11.384					
4	11 40 15.89	1.9541	7 22 9.7	11.429					
5	11 42 13.15	1.9547	7 10 42.6	11.473					
6	11 44 10.45	1.9553	6 59 12.9	11.517					
7	11 46 7.79	1.9559	6 47 40.5	11.561					
8	11 48 5.16	1.9566	6 36 5.6	11.603					
9	11 50 2.58	1.9574	6 24 28.2	11.644					
10	11 52 0.05	1.9582	6 12 48.3	11.686					
11	11 53 57.56	1.9590	6 1 5.9	11.727					
12	11 55 55.13	1.9600	5 49 21.1	11.766	☉ New Moon . . . . Nov. 5 10 38.9 ☾ First Quarter . . . . 12 5 14.4 ☉ Full Moon . . . . 19 12 4.3 ☾ Last Quarter . . . . 27 16 21.0				
13	11 57 52.76	1.9610	5 37 34.0	11.804					
14	11 59 50.45	1.9620	5 25 44.6	11.843					
15	12 1 48.20	1.9631	5 13 52.8	11.882					
16	12 3 46.02	1.9642	5 1 58.8	11.918					
17	12 5 43.91	1.9655	4 50 2.6	11.955					
18	12 7 41.88	1.9668	4 38 4.2	11.990					
19	12 9 39.92	1.9681	4 26 3.8	12.025					
20	12 11 38.05	1.9696	4 14 1.2	12.060					
21	12 13 36.27	1.9710	4 1 56.6	12.092					
22	12 15 34.57	1.9724	3 49 50.1	12.125					
23	12 17 32.96	1.9741	3 37 41.6	12.157					
24	12 19 31.46	1.9757	N. 3 25 31.2	12.189					
SATURDAY 30.									
0	12 21 30.05	1.9774	N. 3 13 18.9	12.220					
1	12 23 28.75	1.9792	3 1 4.8	12.249					
2	12 25 27.55	1.9810	2 48 49.0	12.278					
3	12 27 26.47	1.9829	2 36 31.4	12.307					
4	12 29 25.50	1.9848	2 24 12.2	12.333					
5	12 31 24.65	1.9869	2 11 51.4	12.361					
6	12 33 23.93	1.9890	1 59 28.9	12.387					
7	12 35 23.33	1.9911	1 47 5.0	12.411					
8	12 37 22.86	1.9933	1 34 39.6	12.436					
9	12 39 22.53	1.9956	1 22 12.7	12.459					
10	12 41 22.33	1.9979	1 9 44.5	12.481					
11	12 43 22.28	2.0004	0 57 15.0	12.502					
12	12 45 22.38	2.0029	0 44 44.2	12.523					
13	12 47 22.63	2.0054	0 32 12.2	12.543					
14	12 49 23.03	2.0079	0 19 39.0	12.562					
15	12 51 23.58	2.0106	N. 0 7 4.7	12.581					
16	12 53 24.30	2.0133	S. 0 5 30.7	12.598					
17	12 55 25.18	2.0162	0 18 7.1	12.615					
18	12 57 26.24	2.0190	0 30 44.5	12.631					
19	12 59 27.46	2.0218	0 43 22.8	12.645					
20	13 1 28.86	2.0248	0 56 1.9	12.658					
21	13 3 30.44	2.0279	1 8 41.8	12.671					
22	13 5 32.21	2.0311	1 21 22.4	12.682					
23	13 7 34.17	2.0342	1 34 3.7	12.693					
24	13 9 36.32	2.0375	S. 1 46 45.6	12.703					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
1	Aldebaran W.	95 0 30	2829	96 34 19	2815	98 8 27	2801	99 42 53	2787
	Pollux W.	51 0 34	2868	52 33 34	2852	54 6 55	2836	55 40 36	2821
	SUN E.	54 52 48	3210	53 26 51	3197	52 0 38	3182	50 34 7	3167
2	Aldebaran W.	107 39 49	2713	109 16 11	2698	110 52 54	2683	112 29 57	2667
	Pollux W.	63 34 9	2741	65 9 55	2725	66 46 2	2708	68 22 31	2692
	SUN E.	43 17 7	3093	41 48 50	3078	40 20 14	3064	38 51 20	3049
8	SUN W.	34 4 34	2553	35 44 33	2550	37 24 37	2546	39 4 46	2543
	MARS E.	57 18 57	2398	55 35 20	2398	53 51 42	2398	52 8 4	2398
	Fomalhaut E.	75 37 35	2418	73 54 26	2421	72 11 21	2425	70 28 22	2430
	SATURN E.	92 4 52	2194	90 16 15	2193	88 27 36	2192	86 38 56	2192
	α Pegasi E.	92 18 5	2593	90 39 1	2592	88 59 55	2592	87 20 49	2593
9	SUN W.	47 26 10	2540	49 6 28	2541	50 46 45	2542	52 27 0	2544
	MARS E.	43 30 4	2403	41 46 34	2405	40 3 7	2408	38 19 44	2411
	Fomalhaut E.	61 55 40	2471	60 13 46	2483	58 32 8	2497	56 50 49	2512
	SATURN E.	77 35 46	2197	75 47 14	2199	73 58 45	2202	72 10 20	2205
	α Pegasi E.	79 6 11	2615	77 27 36	2624	75 49 13	2633	74 11 3	2643
10	SUN W.	60 47 21	2561	62 27 10	2564	64 6 54	2569	65 46 32	2574
	MARS E.	29 44 6	2433	28 1 17	2438	26 18 36	2443	24 36 2	2449
	Fomalhaut E.	48 30 17	2615	46 51 42	2642	45 13 44	2673	43 36 28	2708
	SATURN E.	63 9 31	2225	61 21 40	2229	59 33 55	2234	57 46 18	2239
	α Pegasi E.	66 4 17	2716	64 27 59	2736	62 52 7	2757	61 16 43	2780
	α Arietis E.	108 22 48	2387	106 38 55	2390	104 55 6	2392	103 11 20	2395
11	SUN W.	74 2 51	2602	75 41 43	2609	77 20 26	2615	78 59 1	2622
	SATURN E.	48 50 14	2263	47 3 28	2275	45 16 52	2282	43 30 26	2289
	α Pegasi E.	53 28 14	2933	51 56 36	2972	50 25 48	3014	48 55 53	3062
	α Arietis E.	94 33 40	2416	92 50 28	2422	91 7 24	2428	89 24 28	2434
12	SUN W.	87 9 33	2657	88 47 10	2665	90 24 37	2672	92 1 55	2680
	SATURN E.	34 40 54	2326	32 55 33	2334	31 10 23	2343	29 25 26	2352
	α Arietis E.	80 52 20	2472	79 10 28	2481	77 28 48	2490	75 47 21	2500
	Aldebaran E.	111 59 40	2326	110 14 18	2333	108 29 7	2340	106 44 6	2348
13	SUN W.	100 5 45	2719	101 41 59	2727	103 18 3	2735	104 53 56	2744
	α Aquilæ W.	43 25 41	4029	44 36 52	3938	45 49 33	3856	47 3 38	3781
	α Arietis E.	67 23 36	2554	65 43 37	2566	64 3 55	2579	62 24 31	2592
	Aldebaran E.	98 1 36	2384	96 17 38	2391	94 33 50	2398	92 50 12	2405
14	SUN W.	112 50 38	2785	114 25 25	2793	116 0 2	2802	117 34 28	2811
	α Aquilæ W.	53 30 52	3516	54 50 58	3479	56 11 45	3446	57 33 9	3416
	MARS W.	23 54 35	2658	25 32 11	2666	27 9 37	2673	28 46 53	2681
	α Arietis E.	54 12 20	2669	52 34 59	2688	50 58 3	2707	49 21 33	2728
	Aldebaran E.	84 14 44	2443	82 32 11	2450	80 49 48	2458	79 7 36	2466
15	α Aquilæ W.	64 27 24	3314	65 51 19	3300	67 15 31	3289	68 39 57	3279
	MARS W.	36 50 35	2721	38 26 47	2729	40 2 49	2737	41 38 40	2745
	Aldebaran E.	70 39 17	2504	68 58 10	2512	67 17 13	2520	65 36 28	2527
	Pollux E.	114 46 25	2530	113 5 53	2537	111 25 31	2544	109 45 18	2551

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Aldebaran W.	101 17 38	2773	102 52 41	2758	104 28 4	2743	106 3 47	2728
	Pollux W.	57 14 37	2805	58 48 59	2789	60 23 41	2773	61 58 44	2757
	SUN E.	49 7 19	3152	47 40 12	3138	46 12 49	3123	44 45 7	3108
2	Aldebaran W.	114 7 21	2652	115 45 5	2637	117 23 10	2622	119 1 36	2607
	Pollux W.	69 59 21	2676	71 36 32	2660	73 14 5	2644	74 52 0	2629
	SUN E.	37 22 8	3035	35 52 39	3022	34 22 53	3008	32 52 50	2995
8	SUN W.	40 44 59	2542	42 25 14	2540	44 5 32	2539	45 45 51	2539
	MARS E.	50 24 26	2398	48 40 48	2399	46 57 12	2400	45 13 37	2401
	Fomalhaut E.	68 45 30	2436	67 2 46	2443	65 20 12	2451	63 37 49	2460
	SATURN E.	84 50 16	2192	83 1 37	2193	81 12 58	2194	79 24 21	2195
	α Pegasi E.	85 41 45	2395	84 2 43	2399	82 23 46	2603	80 44 55	2608
9	SUN W.	54 7 12	2546	55 47 21	2549	57 27 26	2553	59 7 26	2557
	MARS E.	36 36 25	2415	34 53 11	2419	33 10 3	2423	31 27 1	2428
	Fomalhaut E.	55 9 52	2528	53 29 18	2545	51 49 8	2566	50 9 26	2590
	SATURN E.	70 22 0	2208	68 33 44	2212	66 45 34	2216	64 57 29	2220
	α Pegasi E.	72 33 6	2655	70 55 25	2668	69 18 2	2683	67 40 59	2699
10	SUN W.	67 26 3	2580	69 5 26	2585	70 44 42	2591	72 23 50	2596
	MARS E.	22 53 36	2455	21 11 19	2461	19 29 11	2468	17 47 12	2475
	Fomalhaut E.	41 59 59	2747	40 24 21	2791	38 49 41	2840	37 16 5	2894
	SATURN E.	55 58 48	2245	54 11 27	2250	52 24 14	2256	50 37 9	2262
	α Pegasi E.	59 41 49	2805	58 7 28	2833	56 33 43	2863	55 0 37	2897
	α Arietis E.	101 27 37	2398	99 43 59	2402	98 0 26	2406	96 17 0	2410
11	SUN W.	80 37 26	2629	82 15 42	2636	83 53 48	2643	85 31 45	2649
	SATURN E.	41 44 10	2296	39 58 5	2303	38 12 10	2311	36 26 26	2319
	α Pegasi E.	47 26 57	3114	45 59 4	3171	44 32 20	3234	43 6 52	3304
	α Arietis E.	87 41 42	2441	85 59 5	2448	84 16 39	2456	82 34 24	2464
12	SUN W.	93 39 2	2688	95 15 58	2695	96 52 44	2703	98 29 20	2711
	SATURN E.	27 40 42	2361	25 56 11	2371	24 11 54	2381	22 27 51	2391
	α Arietis E.	74 6 7	2510	72 25 7	2520	70 44 21	2531	69 3 51	2542
	Aldebaran E.	104 59 16	2355	103 14 35	2362	101 30 5	2369	99 45 45	2376
13	SUN W.	106 29 38	2752	108 5 9	2760	109 40 30	2769	111 15 39	2776
	α Aquilæ W.	48 19 0	3716	49 35 30	3657	50 53 3	3605	52 11 32	3558
	α Arietis E.	60 45 25	2606	59 6 38	2620	57 28 10	2636	55 50 4	2652
	Aldebaran E.	91 6 45	2413	89 23 29	2420	87 40 23	2428	85 57 28	2436
14	SUN W.	119 8 42	2819	120 42 45	2828	122 16 37	2836	123 50 18	2844
	α Aquilæ W.	58 55 7	3391	60 17 34	3367	61 40 28	3346	63 3 46	3329
	MARS W.	30 23 59	2689	32 0 54	2697	33 37 38	2705	35 14 12	2713
	α Arietis E.	47 45 30	2751	46 9 57	2775	44 34 56	2801	43 0 29	2828
	Aldebaran E.	77 25 34	2474	75 43 44	2481	74 2 4	2489	72 20 35	2497
15	α Aquilæ W.	70 4 33	3270	71 29 19	3264	72 54 13	3259	74 19 13	3255
	MARS W.	43 14 20	2753	44 49 49	2762	46 25 7	2770	48 0 14	2778
	Aldebaran E.	63 55 53	2535	62 15 29	2544	60 35 17	2552	58 55 16	2560
	Pollux E.	108 5 16	2559	106 25 24	2566	104 45 42	2573	103 6 10	2580

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
16	<i>α</i> Aquilæ W.	75 44 17	3253	77 9 23	3252	78 34 31	3252	79 59 39	3253
	MARS W.	49 35 11	2787	51 9 56	2795	52 44 31	2803	54 18 55	2812
	Fomalhaut W.	40 32 39	3060	42 1 38	3036	43 31 6	3017	45 0 58	3001
	SATURN W.	20 22 11	2583	22 1 29	2588	23 40 40	2594	25 19 43	2600
	Aldebaran E.	57 15 26	2568	55 35 47	2577	53 56 20	2585	52 17 3	2593
	Pollux E.	101 26 48	2588	99 47 37	2596	98 8 36	2604	96 29 46	2612
	JUPITER E.	122 11 58	2581	120 32 37	2588	118 53 26	2596	117 14 26	2604
17	<i>α</i> Aquilæ W.	87 4 31	3276	88 29 11	3283	89 53 42	3291	91 18 4	3300
	MARS W.	62 8 4	2855	63 41 20	2864	65 14 25	2873	66 47 18	2882
	Fomalhaut W.	52 34 28	2951	54 5 42	2946	55 37 3	2942	57 8 28	2940
	<i>α</i> Pegasi W.	39 54 28	3715	41 10 59	3655	42 28 34	3601	43 47 7	3555
	SATURN W.	33 32 50	2634	35 10 59	2642	36 48 57	2649	38 26 45	2657
	Aldebaran E.	44 3 33	2636	42 25 27	2644	40 47 32	2653	39 9 49	2663
	Pollux E.	88 18 18	2652	86 40 34	2660	85 3 1	2669	83 25 40	2678
	JUPITER E.	109 2 8	2644	107 24 13	2653	105 46 30	2661	104 8 58	2669
18	<i>α</i> Aquilæ W.	98 16 48	3363	99 39 48	3378	101 2 30	3394	102 24 54	3411
	MARS W.	74 28 50	2928	76 0 33	2937	77 32 5	2947	79 3 24	2956
	Fomalhaut W.	64 45 54	2942	66 17 19	2945	67 48 41	2949	69 19 59	2953
	<i>α</i> Pegasi W.	50 30 55	3394	51 53 21	3371	53 16 11	3352	54 39 22	3337
	SATURN W.	46 33 4	2698	48 9 46	2707	49 46 17	2716	51 22 36	2724
	Aldebaran E.	31 4 25	2711	29 28 0	2721	27 51 48	2732	26 15 50	2744
	Pollux E.	75 21 48	2722	73 45 38	2732	72 9 40	2741	70 33 54	2750
	JUPITER E.	96 4 5	2712	94 27 41	2720	92 51 28	2729	91 15 27	2738
	Regulus E.	111 11 51	2703	109 35 15	2712	107 58 51	2720	106 22 38	2729
19	MARS W.	86 37 2	3005	88 7 9	3014	89 37 5	3023	91 6 49	3033
	Fomalhaut W.	76 54 59	2979	78 25 38	2986	79 56 8	2993	81 26 30	3000
	<i>α</i> Pegasi W.	61 39 4	3287	63 3 31	3281	64 28 5	3277	65 52 44	3274
	SATURN W.	59 21 18	2769	60 56 27	2778	62 31 24	2786	64 6 9	2796
	Pollux E.	62 38 14	2799	61 3 45	2808	59 29 28	2818	57 55 24	2829
	JUPITER E.	83 18 17	2783	81 43 27	2792	80 8 48	2801	78 34 21	2810
	Regulus E.	98 24 28	2774	96 49 26	2783	95 14 35	2792	93 39 57	2801
20	MARS W.	98 32 25	3082	100 0 56	3092	101 29 15	3101	102 57 23	3111
	Fomalhaut W.	88 55 54	3042	90 25 15	3051	91 54 25	3060	93 23 23	3069
	<i>α</i> Pegasi W.	72 56 21	3275	74 21 2	3278	75 45 39	3281	77 10 13	3284
	SATURN W.	71 56 58	2842	73 30 32	2851	75 3 54	2860	76 37 5	2869
	Pollux E.	50 8 31	2883	48 35 50	2894	47 3 23	2905	45 31 10	2916
	JUPITER E.	70 45 1	2855	69 11 44	2864	67 38 39	2873	66 5 45	2882
	Regulus E.	85 49 42	2846	84 16 15	2855	82 42 59	2864	81 9 55	2873
21	MARS W.	110 15 7	3158	111 42 6	3168	113 8 53	3177	114 35 30	3186
	Fomalhaut W.	100 45 14	3121	102 12 58	3132	103 40 28	3143	105 7 45	3154
	SATURN W.	84 20 7	2913	85 52 9	2921	87 24 1	2930	88 55 42	2938
	<i>α</i> Pegasi W.	84 11 44	3312	85 35 42	3319	86 59 31	3327	88 23 11	3335
	<i>α</i> Arietis W.	40 34 21	3261	41 59 19	3251	43 24 28	3241	44 49 49	3233
	Pollux E.	37 53 53	2978	36 23 13	2992	34 52 50	3006	33 22 45	3021
	JUPITER E.	58 24 7	2926	56 52 21	2934	55 20 45	2943	53 49 21	2951
	Regulus E.	73 27 27	2919	71 55 32	2927	70 23 48	2935	68 52 14	2944

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
16	<i>α</i> Aquilæ W.	81 24 45	3256	82 49 48	3259	84 14 48	3263	85 39 43	3269
	MARS W.	55 53 7	2821	57 27 8	2829	59 0 58	2838	60 34 37	2847
	Fomalhaut W.	46 31 10	2986	48 1 40	2974	49 32 25	2965	51 3 22	2958
	SATURN W.	26 58 38	2606	28 37 25	2612	30 16 3	2619	31 54 31	2626
	Aldebaran E.	50 37 58	2601	48 59 4	2610	47 20 22	2618	45 41 52	2627
	Pollux E.	94 51 6	2620	93 12 38	2627	91 34 20	2635	89 56 13	2644
	JUPITER E.	115 35 37	2612	113 56 58	2620	112 18 31	2628	110 40 14	2636
17	<i>α</i> Aquilæ W.	92 42 15	3311	94 6 14	3322	95 30 0	3334	96 53 32	3348
	MARS W.	68 20 0	2891	69 52 30	2901	71 24 48	2910	72 56 55	2919
	Fomalhaut W.	58 39 56	2939	60 11 26	2939	61 42 56	2939	63 14 26	2940
	<i>α</i> Pegasi W.	45 6 31	3513	46 26 41	3477	47 47 31	3445	49 8 57	3416
	SATURN W.	40 4 23	2665	41 41 50	2673	43 19 6	2681	44 56 11	2690
	Aldebaran E.	37 32 19	2672	35 55 1	2681	34 17 56	2691	32 41 4	2701
	Pollux E.	81 48 30	2687	80 11 32	2695	78 34 45	2704	76 58 10	2713
	JUPITER E.	102 31 37	2678	100 54 27	2686	99 17 28	2695	97 40 41	2703
18	<i>α</i> Aquilæ W.	103 46 58	3439	105 8 41	3450	106 30 1	3471	107 50 58	3493
	MARS W.	80 34 32	2966	82 5 27	2975	83 36 11	2985	85 6 42	2995
	Fomalhaut W.	70 51 11	2957	72 22 18	2962	73 53 19	2967	75 24 13	2973
	<i>α</i> Pegasi W.	56 2 51	3324	57 26 36	3312	58 50 34	3302	60 14 44	3294
	SATURN W.	52 58 44	2733	54 34 40	2742	56 10 24	2751	57 45 57	2760
	Aldebaran E.	24 40 8	2756	23 4 41	2768	21 29 31	2780	19 54 37	2792
	Pollux E.	68 58 20	2760	67 22 59	2769	65 47 51	2779	64 12 56	2789
	JUPITER E.	89 39 38	2747	88 4 0	2756	86 28 34	2765	84 53 20	2774
	Regulus E.	104 46 36	2738	103 10 47	2747	101 35 9	2756	99 59 43	2765
19	MARS W.	92 36 20	3043	94 5 39	3053	95 34 46	3063	97 3 41	3072
	Fomalhaut W.	82 56 43	3008	84 26 46	3016	85 56 39	3024	87 26 22	3033
	<i>α</i> Pegasi W.	67 17 26	3272	68 42 10	3272	70 6 54	3272	71 31 38	3273
	SATURN W.	65 40 43	2805	67 15 4	2814	68 49 14	2823	70 23 12	2832
	Pollux E.	56 21 34	2840	54 47 58	2850	53 14 35	2861	51 41 26	2872
	JUPITER E.	77 0 5	2819	75 26 2	2828	73 52 10	2837	72 18 30	2845
	Regulus E.	92 5 30	2810	90 31 16	2819	88 57 13	2828	87 23 22	2837
20	MARS W.	104 25 19	3121	105 53 3	3130	107 20 36	3140	108 47 57	3149
	Fomalhaut W.	94 52 10	3079	96 20 45	3090	97 49 7	3100	99 17 17	3110
	<i>α</i> Pegasi W.	78 34 43	3289	79 59 7	3294	81 23 26	3299	82 47 39	3305
	SATURN W.	78 10 4	2878	79 42 52	2887	81 15 28	2895	82 47 53	2904
	Pollux E.	43 59 12	2928	42 27 29	2940	40 56 1	2953	39 24 49	2965
	JUPITER E.	64 33 3	2891	63 0 32	2900	61 28 13	2909	59 56 5	2917
	Regulus E.	79 37 2	2883	78 4 21	2892	76 31 52	2901	74 59 34	2910
21	MARS W.	116 1 56	3195	117 28 12	3204	118 54 17	3212	120 20 12	3221
	Fomalhaut W.	106 34 49	3166	108 1 39	3173	109 28 15	3189	110 54 37	3201
	SATURN W.	90 27 12	2916	91 58 32	2954	93 29 42	2962	95 0 42	2970
	<i>α</i> Pegasi W.	89 46 43	3343	91 10 5	3351	92 33 18	3360	93 56 20	3369
	<i>α</i> Arietis W.	46 15 20	3226	47 40 58	3220	49 6 43	3216	50 32 33	3213
	Pollux E.	31 52 58	3037	30 23 31	3054	28 54 25	3072	27 25 40	3090
	JUPITER E.	52 18 7	2959	50 47 4	2967	49 16 10	2975	47 45 26	2983
	Regulus E.	67 20 51	2952	65 49 38	2961	64 18 36	2969	62 47 44	2977

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
22	SATURN W.	96 31 31	2978	98 2 11	2986	99 32 41	2993	101 3 2	3000
	α Pegasi W.	95 19 12	3379	96 41 53	3389	98 4 22	3399	99 26 40	3410
	α Arietis W.	51 58 26	3211	53 24 22	3210	54 50 19	3209	56 16 18	3208
	Aldebaran W.	19 8 50	3008	20 38 53	3012	22 8 51	3017	23 38 43	3021
	JUPITER E.	46 14 52	2991	44 44 28	2998	43 14 13	3006	41 44 7	3013
	Regulus E.	61 17 2	2985	59 46 30	2993	58 16 8	3000	56 45 55	3007
23	SATURN W.	108 32 43	3032	110 2 15	3038	111 31 41	3043	113 1 0	3048
	α Arietis W.	63 26 13	3210	64 52 10	3212	66 18 5	3213	67 43 59	3214
	Aldebaran W.	31 6 45	3043	32 36 5	3047	34 5 19	3052	35 34 28	3056
	JUPITER E.	34 15 48	3046	32 46 32	3052	31 17 24	3058	29 48 23	3063
	Regulus E.	49 16 59	3040	47 47 36	3047	46 18 21	3053	44 49 14	3058
	Spica E.	103 14 56	3065	101 46 3	3070	100 17 17	3075	98 48 37	3079
24	α Arietis W.	74 53 3	3221	76 18 48	3222	77 44 31	3223	79 10 13	3223
	Aldebaran W.	42 59 3	3073	44 27 46	3075	45 56 26	3077	47 25 4	3079
	Regulus E.	37 25 12	3082	35 56 41	3087	34 28 16	3091	32 59 56	3095
	Spica E.	91 26 35	3099	89 58 24	3102	88 30 17	3105	87 2 13	3107
	SUN E.	129 56 1	3168	128 35 1	3470	127 14 3	3472	125 53 8	3474
25	α Arietis W.	86 18 37	3225	87 44 17	3224	89 9 58	3223	90 35 40	3221
	Aldebaran W.	54 47 45	3083	56 16 15	3082	57 44 46	3081	59 13 18	3080
	Spica E.	79 42 26	3113	78 14 32	3114	76 46 39	3113	75 18 45	3112
	SUN E.	119 8 55	3478	117 48 6	3477	116 27 16	3476	115 6 25	3474
26	α Arietis W.	97 44 35	3213	99 10 29	3210	100 36 26	3207	102 2 27	3204
	Aldebaran W.	66 36 33	3067	68 5 23	3063	69 34 17	3059	71 3 17	3055
	Pollux W.	23 2 49	3214	24 28 41	3196	25 54 55	3179	27 21 31	3162
	Spica E.	67 58 55	3104	66 30 50	3101	65 2 41	3097	63 34 28	3093
	SUN E.	108 21 34	3460	107 0 25	3455	105 39 11	3450	104 17 51	3445
27	Aldebaran W.	78 29 56	3022	79 59 41	3015	81 29 35	3007	82 59 39	2998
	Pollux W.	34 39 5	3091	36 7 25	3079	37 36 0	3066	39 4 51	3054
	Spica E.	56 12 6	3070	54 43 19	3064	53 14 26	3058	51 45 25	3052
	SUN E.	97 29 30	3410	96 7 25	3402	94 45 11	3393	93 22 46	3383
28	Aldebaran W.	90 32 54	2948	92 4 11	2937	93 35 43	2925	95 7 30	2913
	Pollux W.	46 32 59	2989	48 3 25	2976	49 34 8	2962	51 5 8	2948
	JUPITER W.	25 17 6	2960	26 48 9	2947	28 19 28	2934	29 51 3	2921
	Spica E.	44 18 19	3018	42 48 28	3011	41 18 29	3004	39 48 21	2997
	SUN E.	86 27 48	3328	85 4 10	3316	83 40 17	3303	82 16 9	3290
29	Aldebaran W.	102 50 27	2846	104 23 55	2831	105 57 42	2816	107 31 48	2801
	Pollux W.	58 44 40	2875	60 17 31	2859	61 50 42	2843	63 24 14	2827
	JUPITER W.	37 33 20	2850	39 6 43	2835	40 40 25	2820	42 14 27	2804
	Regulus W.	22 48 49	2882	24 21 31	2863	25 54 37	2845	27 28 7	2827
	SUN E.	75 11 26	3217	73 45 37	3201	72 19 29	3185	70 53 2	3168
30	Pollux W.	71 17 13	2743	72 52 56	2726	74 29 1	2708	76 5 30	2691
	JUPITER W.	50 9 54	2721	51 46 6	2704	53 22 40	2687	54 59 38	2669
	Regulus W.	35 21 32	2735	36 57 25	2717	38 33 42	2699	40 10 24	2681
	SUN E.	63 35 40	3081	62 7 7	3063	60 38 12	3044	59 8 54	3026



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
22	SATURN W.	102 33 15	3007	104 3 19	3014	105 33 15	3020	107 3 3	3026
	α Pegasi W.	100 48 45	3421	102 10 38	3432	103 32 18	3443	104 53 45	3454
	α Arietis W.	57 42 18	3208	59 8 18	3209	60 34 16	3209	62 0 15	3209
	Aldebaran W.	25 8 30	3025	26 38 12	3029	28 7 49	3034	29 37 20	3039
	JUPITER E.	40 14 11	3020	38 44 23	3027	37 14 43	3033	35 45 12	3039
	Regulus E.	55 15 51	3014	53 45 56	3021	52 16 9	3027	50 46 30	3034
23	SATURN W.	114 30 13	3053	115 59 20	3058	117 28 21	3062	118 57 17	3066
	α Arietis W.	69 9 51	3216	70 35 41	3217	72 1 30	3219	73 27 17	3220
	Aldebaran W.	37 3 32	3060	38 32 31	3063	40 1 26	3066	41 30 17	3070
	JUPITER E.	28 19 28	3069	26 50 40	3074	25 21 59	3080	23 53 25	3086
	Regulus E.	43 20 13	3064	41 51 19	3069	40 22 31	3073	38 53 49	3078
	Spica E.	97 20 2	3084	95 51 33	3088	94 23 9	3092	92 54 50	3096
24	α Arietis W.	80 35 55	3224	82 1 36	3225	83 27 16	3225	84 52 56	3224
	Aldebaran W.	48 53 39	3081	50 22 12	3082	51 50 44	3082	53 19 15	3083
	Regulus E.	31 31 40	3099	30 3 29	3103	28 35 23	3106	27 7 21	3110
	Spica E.	85 34 11	3109	84 6 12	3110	82 38 16	3111	81 10 20	3112
	SUN E.	124 32 15	3476	123 11 24	3477	121 50 34	3477	120 29 44	3478
25	α Arietis W.	92 1 24	3220	93 27 9	3219	94 52 55	3217	96 18 44	3215
	Aldebaran W.	60 41 52	3078	62 10 28	3076	63 39 6	3073	65 7 47	3070
	Spica E.	73 50 50	3111	72 22 54	3110	70 54 57	3108	69 26 57	3106
	SUN E.	113 45 32	3472	112 24 37	3470	111 3 39	3467	109 42 38	3464
26	α Arietis W.	103 28 31	3201	104 54 39	3198	106 20 51	3194	107 47 8	3189
	Aldebaran W.	72 32 22	3049	74 1 34	3043	75 30 53	3037	77 0 20	3030
	Pollux W.	28 48 26	3146	30 15 40	3131	31 43 12	3117	33 11 1	3104
	Spica E.	62 6 10	3089	60 37 48	3085	59 9 20	3080	57 40 46	3075
	SUN E.	102 56 25	3439	101 34 53	3432	100 13 13	3425	98 51 26	3418
27	Aldebaran W.	84 29 54	2989	86 0 20	2979	87 30 59	2969	89 1 50	2959
	Pollux W.	40 33 57	3041	42 3 19	3029	43 32 56	3016	45 2 49	3002
	Spica E.	50 16 16	3045	48 46 59	3039	47 17 34	3032	45 48 1	3025
	SUN E.	92 0 10	3373	90 37 23	3363	89 14 24	3352	87 51 13	3340
28	Aldebaran W.	96 39 32	2900	98 11 50	2887	99 44 25	2874	101 17 17	2860
	Pollux W.	52 36 26	2934	54 8 2	2920	55 39 56	2905	57 12 9	2890
	JUPITER W.	31 22 55	2908	32 55 4	2894	34 27 31	2880	36 0 16	2865
	Spica E.	38 18 4	2991	36 47 39	2985	35 17 8	2979	33 46 29	2973
	SUN E.	80 51 46	3276	79 27 7	3262	78 2 11	3247	76 36 57	3232
29	Aldebaran W.	109 6 14	2786	110 41 0	2770	112 16 7	2754	113 51 35	2738
	Pollux W.	64 58 7	2811	66 32 21	2795	68 6 56	2778	69 41 53	2760
	JUPITER W.	43 48 49	2788	45 23 33	2772	46 58 38	2755	48 34 5	2738
	Regulus W.	29 2 0	2808	30 36 17	2790	32 10 58	2772	33 46 3	2753
	SUN E.	69 26 15	3152	67 59 8	3134	66 31 40	3117	65 3 51	3099
30	Pollux W.	77 42 22	2673	79 19 38	2655	80 57 19	2637	82 35 24	2618
	JUPITER W.	56 36 59	2652	58 14 44	2633	59 52 54	2615	61 31 29	2597
	Regulus W.	41 47 30	2662	43 25 1	2643	45 2 57	2625	46 41 18	2606
	SUN E.	57 39 14	3007	56 9 10	2988	54 38 43	2969	53 7 52	2950

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian	Equation of Time, to be Subtracted from	
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.		Added to Apparent Time.	Diff. for 1 Hour.
<i>SUN.</i>	1	<sup>h</sup> 16 <sup>m</sup> 25 <sup>s</sup> 31.01	10.776	S. 21° 40' 29.5"	- 24.26	16 15.22	70.17	<sup>m</sup> 11 <sup>s</sup> 13.46	0.917
Mon.	2	16 29 49.97	10.804	21 49 59.4	23.22	16 15.37	70.26	10 51.12	0.944
Tues.	3	16 34 9.58	10.831	21 59 4.1	22.17	16 15.52	70.35	10 28.13	0.971
Wed.	4	16 38 29.84	10.856	22 7 43.5	- 21.11	16 15.66	70.43	10 4.50	0.997
Thur.	5	16 42 50.69	10.880	22 15 57.2	20.03	16 15.80	70.51	9 40.26	1.022
Frid.	6	16 47 12.12	10.904	22 23 45.0	18.95	16 15.94	70.58	9 15.46	1.045
Sat.	7	16 51 34.09	10.926	22 31 6.8	- 17.85	16 16.08	70.65	8 50.11	1.067
<i>SUN.</i>	8	16 55 56.57	10.947	22 38 1.9	16.74	16 16.21	70.72	8 24.26	1.087
Mon.	9	17 0 19.54	10.967	22 44 30.4	15.63	16 16.34	70.79	7 57.93	1.107
Tues.	10	17 4 42.94	10.985	22 50 32.1	- 14.51	16 16.46	70.85	7 31.14	1.125
Wed.	11	17 9 6.77	11.001	22 56 6.7	13.37	16 16.58	70.91	7 3.94	1.141
Thur.	12	17 13 31.00	11.016	23 1 13.9	12.23	16 16.70	70.96	6 36.36	1.157
Frid.	13	17 17 55.59	11.031	23 5 53.8	- 11.09	16 16.81	71.01	6 8.40	1.171
Sat.	14	17 22 20.49	11.044	23 10 6.1	9.94	16 16.92	71.06	5 40.13	1.184
<i>SUN.</i>	15	17 26 45.69	11.056	23 13 50.5	8.78	16 17.02	71.10	5 11.57	1.196
Mon.	16	17 31 11.17	11.067	23 17 7.4	- 7.62	16 17.12	71.14	4 42.73	1.207
Tues.	17	17 35 36.88	11.076	23 19 56.2	6.45	16 17.21	71.17	4 13.65	1.216
Wed.	18	17 40 2.80	11.084	23 22 16.9	5.28	16 17.29	71.20	3 44.37	1.224
Thur.	19	17 44 28.91	11.091	23 24 9.5	- 4.10	16 17.37	71.22	3 14.90	1.231
Frid.	20	17 48 55.16	11.096	23 25 34.0	2.93	16 17.44	71.24	2 45.29	1.236
Sat.	21	17 53 21.53	11.101	23 26 30.3	1.76	16 17.50	71.25	2 15.56	1.241
<i>SUN.</i>	22	17 57 47.99	11.104	23 26 58.3	- 0.58	16 17.56	71.26	1 45.73	1.244
Mon.	23	18 2 14.51	11.105	23 26 58.0	+ 0.60	16 17.61	71.26	1 15.85	1.245
Tues.	24	18 6 41.05	11.106	23 26 29.5	1.78	16 17.66	71.26	0 45.95	1.246
Wed.	25	18 11 7.59	11.105	23 25 32.7	+ 2.96	16 17.70	71.26	0 16.05	1.245
Thur.	26	18 15 34.08	11.103	23 24 7.6	4.14	16 17.74	71.25	0 13.81	1.243
Frid.	27	18 20 0.52	11.100	23 22 14.3	5.31	16 17.77	71.23	0 43.61	1.239
Sat.	28	18 24 26.85	11.095	23 19 52.8	+ 6.48	16 17.79	71.21	1 13.30	1.234
<i>SUN.</i>	29	18 28 53.04	11.088	23 17 3.3	7.65	16 17.81	71.19	1 42.85	1.228
Mon.	30	18 33 19.06	11.080	23 13 45.7	8.82	16 17.83	71.16	2 12.23	1.220
Tues.	31	18 37 44.87	11.071	23 10 0.1	9.98	16 17.84	71.13	2 41.41	1.211
Wed.	32	18 42 10.45	11.061	S. 23° 5' 46.7"	+ 11.14	16 17.85	71.09	3 10.36	1.200

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.19 from the sidereal time.

The sign - prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to		Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Subtracted from Mean Time.			
SUN.	1	<sup>h</sup> 16 <sup>m</sup> 25 <sup>s</sup> 33.01	<sup>s</sup> 10.773	<sup>°</sup> 21 <sup>'</sup> 40 <sup>"</sup> 33.9	<sup>"</sup> -24.25	<sup>m</sup> 11 <sup>s</sup> 13.29	<sup>s</sup> 0.917	<sup>h</sup> 16 <sup>m</sup> 36 <sup>s</sup> 46.30	
Mon.	2	16 29 51.91	10.801	21 50 3.5	23.21	10 50.95	0.944	16 40 42.86	
Tues.	3	16 34 11.46	10.828	21 59 7.9	22.16	10 27.96	0.971	16 44 39.42	
Wed.	4	16 38 31.65	10.854	22 7 47.0	-21.10	10 4.33	0.997	16 48 35.98	
Thur.	5	16 42 52.43	10.878	22 16 0.4	20.02	9 40.10	1.022	16 52 32.53	
Frid.	6	16 47 13.79	10.901	22 23 47.9	18.94	9 15.30	1.045	16 56 29.09	
Sat.	7	16 51 35.69	10.923	22 31 9.3	-17.84	8 49.96	1.067	17 0 25.65	
SUN.	8	16 55 58.10	10.944	22 38 4.2	16.73	8 24.11	1.087	17 4 22.21	
Mon.	9	17 0 20.99	10.964	22 44 32.4	15.62	7 57.77	1.107	17 8 18.76	
Tues.	10	17 4 44.32	10.982	22 50 33.8	-14.49	7 31.00	1.125	17 12 15.32	
Wed.	11	17 9 8.07	10.998	22 56 8.2	13.36	7 3.81	1.141	17 16 11.88	
Thur.	12	17 13 32.21	11.013	23 1 15.2	12.22	6 36.23	1.157	17 20 8.44	
Frid.	13	17 17 56.71	11.027	23 5 54.9	-11.08	6 8.28	1.171	17 24 4.99	
Sat.	14	17 22 21.53	11.040	23 10 7.0	9.93	5 40.02	1.184	17 28 1.55	
SUN.	15	17 26 46.64	11.052	23 13 51.3	8.77	5 11.47	1.196	17 31 58.11	
Mon.	16	17 31 12.03	11.063	23 17 8.0	-7.61	4 42.64	1.207	17 35 54.67	
Tues.	17	17 35 37.65	11.072	23 19 56.6	6.44	4 13.57	1.216	17 39 51.22	
Wed.	18	17 40 3.48	11.080	23 22 17.2	5.27	3 44.30	1.224	17 43 47.78	
Thur.	19	17 44 29.50	11.087	23 24 9.7	-4.10	3 14.84	1.231	17 47 44.34	
Frid.	20	17 48 55.66	11.093	23 25 34.1	2.93	2 45.24	1.236	17 51 40.90	
Sat.	21	17 53 21.94	11.097	23 26 30.3	1.76	2 15.52	1.241	17 55 37.46	
SUN.	22	17 57 48.31	11.100	23 26 58.3	-0.58	1 45.70	1.244	17 59 34.01	
Mon.	23	18 2 14.74	11.102	23 26 58.0	+0.60	1 15.83	1.245	18 3 30.57	
Tues.	24	18 6 41.19	11.102	23 26 29.5	1.78	0 45.94	1.246	18 7 27.13	
Wed.	25	18 11 7.64	11.101	23 25 32.7	+2.95	0 16.05	1.245	18 11 23.69	
Thur.	26	18 15 34.05	11.099	23 24 7.6	4.13	0 13.80	1.243	18 15 20.25	
Frid.	27	18 20 0.39	11.095	23 22 14.4	5.30	0 43.59	1.239	18 19 16.80	
Sat.	28	18 24 26.63	11.090	23 19 53.0	+6.48	1 13.27	1.234	18 23 13.36	
SUN.	29	18 28 52.73	11.084	23 17 3.6	7.65	1 42.81	1.228	18 27 9.92	
Mon.	30	18 33 18.66	11.076	23 13 46.1	8.81	2 12.18	1.220	18 31 6.48	
Tues.	31	18 37 44.39	11.067	23 10 0.6	9.97	2 41.35	1.211	18 35 3.04	
Wed.	32	18 42 9.88	11.057	S.23 5 47.3	+11.13	3 10.29	1.200	18 38 59.60	

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
 The sign — prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 Hour,  
 + 9<sup>s</sup>.8565.  
 (Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	335	248° 9' 10.5"	8° 42.2'	152.12	+ 0.32	9.993 8480	- 28.2	h m s 7 22 1.08
2	336	249 10 2.1	9 33.6	152.18	0.29	9.993 7811	27.6	7 18 5.17
3	337	250 10 54.9	10 26.3	152.23	0.24	9.993 7157	27.0	7 14 9.26
4	338	251 11 49.1	11 20.3	152.28	+ 0.16	9.993 6515	- 26.5	7 10 13.35
5	339	252 12 44.4	12 15.4	152.33	+ 0.05	9.993 5886	25.9	7 6 17.44
6	340	253 13 40.8	13 11.6	152.37	- 0.08	9.993 5270	25.4	7 2 21.53
7	341	254 14 38.0	14 8.7	152.41	- 0.21	9.993 4667	- 24.8	6 58 25.61
8	342	255 15 36.1	15 6.6	152.44	0.35	9.993 4078	24.2	6 54 29.70
9	343	256 16 35.0	16 5.2	152.47	0.47	9.993 3505	23.6	6 50 33.79
10	344	257 17 34.4	17 4.6	152.49	- 0.59	9.993 2948	- 22.9	6 46 37.88
11	345	258 18 34.5	18 4.4	152.52	0.68	9.993 2408	22.1	6 42 41.97
12	346	259 19 35.1	19 4.8	152.54	0.76	9.993 1888	21.2	6 38 46.06
13	347	260 20 36.2	20 5.7	152.56	- 0.80	9.993 1390	- 20.3	6 34 50.14
14	348	261 21 37.7	21 7.2	152.58	0.79	9.993 0916	19.3	6 30 54.23
15	349	262 22 39.8	22 9.0	152.60	0.76	9.993 0464	18.3	6 26 58.32
16	350	263 23 42.3	23 11.4	152.62	- 0.71	9.993 0038	- 17.2	6 23 2.41
17	351	264 24 45.4	24 14.3	152.64	0.62	9.992 9639	16.1	6 19 6.50
18	352	265 25 48.9	25 17.6	152.66	0.52	9.992 9266	15.0	6 15 10.59
19	353	266 26 53.0	26 21.6	152.68	- 0.39	9.992 8920	- 13.8	6 11 14.67
20	354	267 27 57.7	27 26.0	152.71	0.25	9.992 8602	12.7	6 7 18.76
21	355	268 29 2.9	28 31.0	152.73	- 0.11	9.992 8311	11.6	6 3 22.85
22	356	269 30 8.6	29 36.6	152.75	+ 0.01	9.992 8047	- 10.5	5 59 26.94
23	357	270 31 15.0	30 42.8	152.77	0.13	9.992 7810	9.3	5 55 31.02
24	358	271 32 21.9	31 49.5	152.80	0.24	9.992 7599	8.2	5 51 35.11
25	359	272 33 29.4	32 56.8	152.83	+ 0.34	9.992 7414	- 7.2	5 47 39.20
26	360	273 34 37.5	34 4.7	152.85	0.41	9.992 7254	6.2	5 43 43.29
27	361	274 35 46.1	35 13.2	152.87	0.46	9.992 7118	5.2	5 39 47.38
28	362	275 36 55.3	36 22.1	152.89	+ 0.47	9.992 7005	- 4.3	5 35 51.46
29	363	276 38 5.0	37 31.6	152.91	0.45	9.992 6914	3.4	5 31 55.55
30	364	277 39 15.1	38 41.6	152.93	0.41	9.992 6844	2.5	5 27 59.64
31	365	278 40 25.7	39 52.0	152.95	0.33	9.992 6793	1.7	5 24 3.73
32	366	279 41 36.6	41 2.7	152.96	+ 0.24	9.992 6760	- 1.0	5 20 7.82

NOTE.—The longitudes in the column  $\lambda$  are referred to the true equinox of their own date, while those in the column  $\lambda'$  are referred to the mean equinox of the beginning of the Bessellian fictitious year.

Diff. for 1 Hour,  
— 9<sup>s</sup>.8296.  
(Table II.)

## GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S									
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.	
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.	
	' "	' "	' "	"	' "	"	h m	m	d	
1	15 37.6	15 45.0	57 15.3	+ 2.23	57 42.3	+ 2.26	21 13.4	2.02	25.6	
2	15 52.4	15 59.7	58 9.5	2.25	58 36.1	2.18	22 3.6	2.17	26.6	
3	16 6.6	16 13.1	59 1.5	2.06	59 25.4	1.89	22 57.6	2.33	27.6	
4	16 18.9	16 24.0	59 46.8	+ 1.66	60 5.2	+ 1.40	23 55.6	2.49	28.6	
5	16 28.0	16 31.1	60 20.3	1.10	60 31.5	0.77	0	.	0.1	
6	16 33.0	16 33.9	60 38.6	+ 0.42	60 41.7	+ 0.08	0 57.1	2.62	1.1	
7	16 33.6	16 32.2	60 40.6	- 0.26	60 35.5	- 0.58	2 0.3	2.64	2.1	
8	16 29.9	16 26.6	60 26.9	0.86	60 15.0	1.11	3 3.0	2.56	3.1	
9	16 22.6	16 18.1	60 0.4	1.31	59 43.7	1.47	4 2.8	2.42	4.1	
10	16 13.0	16 7.7	59 25.2	- 1.60	59 5.6	- 1.67	4 59.0	2.25	5.1	
11	16 2.1	15 56.5	58 45.2	1.72	58 24.5	1.73	5 51.2	2.10	6.1	
12	15 50.8	15 45.3	58 3.8	1.71	57 43.5	1.67	6 40.3	1.99	7.1	
13	15 39.9	15 34.7	57 23.7	- 1.62	57 4.6	- 1.56	7 27.2	1.92	8.1	
14	15 29.7	15 25.0	56 46.3	1.49	56 28.9	1.41	8 12.8	1.90	9.1	
15	15 20.5	15 16.3	56 12.4	1.34	55 56.8	1.26	8 58.6	1.91	10.1	
16	15 12.5	15 8.6	55 42.2	- 1.18	55 28.4	- 1.10	9 44.8	1.94	11.1	
17	15 5.1	15 1.8	55 15.6	1.03	55 3.6	0.96	10 31.9	1.99	12.1	
18	14 58.8	14 56.0	54 52.5	0.89	54 42.4	0.81	11 20.2	2.04	13.1	
19	14 53.5	14 51.2	54 33.1	- 0.73	54 24.8	- 0.65	12 9.5	2.06	14.1	
20	14 49.2	14 47.5	54 17.6	0.56	54 11.5	0.46	12 59.0	2.06	15.1	
21	14 46.2	14 45.3	54 6.6	0.35	54 3.0	- 0.24	13 48.2	2.02	16.1	
22	14 44.7	14 44.5	54 0.9	- 0.11	54 0.5	+ 0.03	14 36.2	1.97	17.1	
23	14 44.9	14 45.8	54 1.7	+ 0.18	54 4.9	0.35	15 22.7	1.91	18.1	
24	14 47.2	14 49.2	54 10.0	0.52	54 17.3	0.70	16 7.7	1.85	19.1	
25	14 51.8	14 55.0	54 26.8	+ 0.89	54 38.7	+ 1.08	16 51.6	1.81	20.1	
26	14 58.9	15 3.4	54 52.8	1.28	55 9.4	1.48	17 34.9	1.80	21.1	
27	15 8.5	15 14.3	55 28.3	1.67	55 49.5	1.85	18 18.4	1.83	22.1	
28	15 20.6	15 27.5	56 12.8	+ 2.02	56 38.1	+ 2.17	19 3.2	1.91	23.1	
29	15 34.9	15 42.5	57 5.0	2.29	57 33.2	2.38	19 50.3	2.03	24.1	
30	15 50.4	15 58.4	58 2.2	2.43	58 31.5	2.43	20 40.8	2.19	25.1	
31	16 6.3	16 14.0	59 0.6	2.38	59 28.6	2.27	21 35.7	2.38	26.1	
32	16 21.1	16 27.6	59 55.0	+ 2.09	60 18.9	+ 1.86	22 35.1	2.58	27.1	

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 1.					TUESDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	13 9 36.32	2.0375	S. 1 46 45.6	12.703	0	14 52 20.40	2.2653	S. 11 46 19.3	11.784
1	13 11 38.67	2.0408	1 59 28.1	12.712	1	14 54 36.50	2.2714	11 58 4.8	11.731
2	13 13 41.22	2.0442	2 12 11.0	12.719	2	14 56 52.97	2.2776	12 9 47.0	11.676
3	13 15 43.97	2.0476	2 24 54.4	12.727	3	14 59 9.81	2.2837	12 21 25.9	11.619
4	13 17 46.93	2.0511	2 37 38.2	12.732	4	15 1 27.01	2.2898	12 33 1.3	11.562
5	13 19 50.10	2.0547	2 50 22.3	12.737	5	15 3 44.58	2.2959	12 44 33.3	11.502
6	13 21 53.49	2.0583	3 3 6.7	12.741	6	15 6 2.52	2.3021	12 56 1.6	11.441
7	13 23 57.10	2.0620	3 15 51.2	12.743	7	15 8 20.83	2.3083	13 7 26.2	11.378
8	13 26 0.93	2.0657	3 28 35.9	12.746	8	15 10 39.51	2.3146	13 18 47.0	11.313
9	13 28 4.99	2.0696	3 41 20.7	12.746	9	15 12 58.58	2.3209	13 30 3.8	11.247
10	13 30 9.28	2.0734	3 54 5.4	12.745	10	15 15 18.02	2.3271	13 41 16.7	11.181
11	13 32 13.80	2.0774	4 6 50.1	12.743	11	15 17 37.83	2.3334	13 52 25.5	11.111
12	13 34 18.57	2.0815	4 19 34.6	12.740	12	15 19 58.03	2.3398	14 3 30.0	11.039
13	13 36 23.58	2.0856	4 32 18.9	12.736	13	15 22 18.61	2.3462	14 14 30.2	10.967
14	13 38 28.84	2.0897	4 45 2.9	12.731	14	15 24 39.57	2.3525	14 25 26.0	10.892
15	13 40 34.35	2.0939	4 57 46.6	12.725	15	15 27 0.91	2.3589	14 36 17.3	10.816
16	13 42 40.11	2.0982	5 10 29.9	12.717	16	15 29 22.64	2.3653	14 47 3.9	10.737
17	13 44 46.13	2.1026	5 23 12.7	12.709	17	15 31 44.75	2.3717	14 57 45.8	10.658
18	13 46 52.42	2.1070	5 35 55.0	12.699	18	15 34 7.25	2.3782	15 8 22.9	10.577
19	13 48 58.97	2.1114	5 48 36.6	12.687	19	15 36 30.13	2.3846	15 18 55.1	10.495
20	13 51 5.79	2.1160	6 1 17.5	12.676	20	15 38 53.40	2.3910	15 29 22.3	10.410
21	13 53 12.89	2.1206	6 13 57.7	12.662	21	15 41 17.05	2.3974	15 39 44.3	10.323
22	13 55 20.26	2.1252	6 26 37.0	12.647	22	15 43 41.09	2.4039	15 50 1.1	10.236
23	13 57 27.91	2.1299	S. 6 39 15.4	12.632	23	15 46 5.52	2.4103	S. 16 0 12.6	10.146
MONDAY 2.					WEDNESDAY 4.				
0	13 59 35.85	2.1347	S. 6 51 52.8	12.614	0	15 48 30.33	2.4167	S. 16 10 18.6	10.054
1	14 1 44.07	2.1395	7 4 29.1	12.596	1	15 50 55.53	2.4232	16 20 19.1	9.961
2	14 3 52.59	2.1444	7 17 4.3	12.576	2	15 53 21.11	2.4296	16 30 13.9	9.866
3	14 6 1.40	2.1493	7 29 38.2	12.554	3	15 55 47.08	2.4360	16 40 3.0	9.770
4	14 8 10.51	2.1543	7 42 10.8	12.532	4	15 58 13.43	2.4423	16 49 46.3	9.672
5	14 10 19.92	2.1593	7 54 42.0	12.508	5	16 0 40.16	2.4487	16 59 23.6	9.571
6	14 12 29.63	2.1645	8 7 11.8	12.483	6	16 3 7.28	2.4551	17 8 54.8	9.469
7	14 14 39.66	2.1697	8 19 40.0	12.456	7	16 5 34.77	2.4614	17 18 19.9	9.367
8	14 16 50.00	2.1749	8 32 6.5	12.428	8	16 8 2.65	2.4677	17 27 38.8	9.262
9	14 19 0.65	2.1802	8 44 31.4	12.399	9	16 10 30.90	2.4739	17 36 51.3	9.155
10	14 21 11.63	2.1856	8 56 54.4	12.368	10	16 12 59.52	2.4802	17 45 57.4	9.047
11	14 23 22.92	2.1909	9 9 15.6	12.337	11	16 15 28.52	2.4864	17 54 56.9	8.936
12	14 25 34.54	2.1964	9 21 34.8	12.302	12	16 17 57.89	2.4926	18 3 49.7	8.824
13	14 27 46.49	2.2019	9 33 51.9	12.267	13	16 20 27.63	2.4987	18 12 35.8	8.711
14	14 29 58.77	2.2074	9 46 6.9	12.232	14	16 22 57.73	2.5047	18 21 15.0	8.596
15	14 32 11.38	2.2130	9 58 19.7	12.193	15	16 25 28.20	2.5108	18 29 47.3	8.479
16	14 34 24.33	2.2187	10 10 30.1	12.153	16	16 27 59.03	2.5168	18 38 12.5	8.360
17	14 36 37.62	2.2243	10 22 38.1	12.112	17	16 30 30.22	2.5227	18 46 30.5	8.240
18	14 38 51.25	2.2301	10 34 43.6	12.071	18	16 33 1.76	2.5287	18 54 41.3	8.119
19	14 41 5.23	2.2359	10 46 46.6	12.027	19	16 35 33.66	2.5345	19 2 44.8	7.997
20	14 43 19.56	2.2417	10 58 46.8	11.981	20	16 38 5.90	2.5402	19 10 40.9	7.872
21	14 45 34.24	2.2476	11 10 44.3	11.935	21	16 40 38.49	2.5460	19 18 29.4	7.745
22	14 47 49.27	2.2535	11 22 39.0	11.887	22	16 43 11.42	2.5516	19 26 10.3	7.617
23	14 50 4.66	2.2594	11 34 30.7	11.836	23	16 45 44.68	2.5572	19 33 43.5	7.488
24	14 52 20.40	2.2653	S. 11 46 19.3	11.784	24	16 48 18.28	2.5627	S. 19 41 8.9	7.357

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 5.					SATURDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	16 48 18.28	2.5627	S. 19 41 8.9	7.357	0	18 55 40.40	2.6941	S. 22 40 53.5	0.172
1	16 50 52.20	2.5681	19 48 26.4	7.225	1	18 58 22.03	2.6933	22 40 38.1	0.341
2	16 53 26.45	2.5735	19 55 35.9	7.091	2	19 1 3.60	2.6924	22 40 12.6	0.510
3	16 56 1.02	2.5788	20 2 37.3	6.955	3	19 3 45.12	2.6914	22 39 36.9	0.678
4	16 58 35.91	2.5840	20 9 30.5	6.818	4	19 6 26.57	2.6902	22 38 51.2	0.846
5	17 1 11.10	2.5890	20 16 15.5	6.681	5	19 9 7.95	2.6889	22 37 55.4	1.013
6	17 3 46.59	2.5941	20 22 52.2	6.541	6	19 11 49.24	2.6873	22 36 49.6	1.181
7	17 6 22.39	2.5991	20 29 20.4	6.400	7	19 14 30.43	2.6857	22 35 33.7	1.348
8	17 8 58.48	2.6038	20 35 40.2	6.258	8	19 17 11.52	2.6839	22 34 7.8	1.514
9	17 11 34.85	2.6086	20 41 51.4	6.115	9	19 19 52.50	2.6820	22 32 32.0	1.680
10	17 14 11.51	2.6132	20 47 54.0	5.970	10	19 22 33.36	2.6799	22 30 46.2	1.847
11	17 16 48.44	2.6177	20 53 47.8	5.823	11	19 25 14.09	2.6777	22 28 50.4	2.012
12	17 19 25.64	2.6222	20 59 32.8	5.676	12	19 27 54.69	2.6754	22 26 44.8	2.176
13	17 22 3.10	2.6265	21 5 8.9	5.527	13	19 30 35.14	2.6728	22 24 29.3	2.340
14	17 24 40.82	2.6307	21 10 36.1	5.378	14	19 33 15.43	2.6702	22 22 4.0	2.503
15	17 27 18.79	2.6348	21 15 54.3	5.227	15	19 35 55.56	2.6674	22 19 28.9	2.667
16	17 29 57.00	2.6388	21 21 3.4	5.075	16	19 38 35.52	2.6645	22 16 44.0	2.828
17	17 32 35.45	2.6427	21 26 3.3	4.922	17	19 41 15.30	2.6614	22 13 49.5	2.989
18	17 35 14.13	2.6464	21 30 54.0	4.767	18	19 43 54.89	2.6582	22 10 45.3	3.150
19	17 37 53.02	2.6500	21 35 35.4	4.612	19	19 46 34.29	2.6550	22 7 31.5	3.309
20	17 40 32.13	2.6536	21 40 7.5	4.457	20	19 49 13.49	2.6516	22 4 8.2	3.467
21	17 43 11.45	2.6569	21 44 30.2	4.299	21	19 51 52.48	2.6481	22 0 35.4	3.626
22	17 45 50.96	2.6601	21 48 43.4	4.141	22	19 54 31.26	2.6444	21 56 53.1	3.783
23	17 48 30.66	2.6632	S. 21 52 47.1	3.982	23	19 57 9.81	2.6406	S. 21 53 1.4	3.939
FRIDAY 6.					SUNDAY 8.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	17 51 10.55	2.6662	S. 21 56 41.2	3.822	0	19 59 48.13	2.6367	S. 21 49 0.4	4.094
1	17 53 50.61	2.6691	22 0 25.7	3.662	1	20 2 26.21	2.6327	21 44 50.1	4.248
2	17 56 30.84	2.6718	22 4 0.6	3.500	2	20 5 4.05	2.6285	21 40 30.6	4.401
3	17 59 11.23	2.6744	22 7 25.7	3.337	3	20 7 41.63	2.6242	21 36 2.0	4.552
4	18 1 51.77	2.6768	22 10 41.1	3.175	4	20 10 18.96	2.6199	21 31 24.3	4.704
5	18 4 32.45	2.6791	22 13 46.7	3.011	5	20 12 56.02	2.6155	21 26 37.5	4.854
6	18 7 13.26	2.6812	22 16 42.4	2.847	6	20 15 32.82	2.6110	21 21 41.8	5.002
7	18 9 54.19	2.6832	22 19 28.3	2.682	7	20 18 9.34	2.6063	21 16 37.3	5.149
8	18 12 35.24	2.6851	22 22 4.3	2.517	8	20 20 45.58	2.6016	21 11 23.9	5.297
9	18 15 16.40	2.6868	22 24 30.3	2.351	9	20 23 21.53	2.5967	21 6 1.7	5.442
10	18 17 57.66	2.6883	22 26 46.4	2.184	10	20 25 57.19	2.5918	21 0 30.9	5.585
11	18 20 39.00	2.6897	22 28 52.4	2.018	11	20 28 32.55	2.5868	20 54 51.5	5.727
12	18 23 20.43	2.6910	22 30 48.5	1.851	12	20 31 7.61	2.5817	20 49 3.6	5.869
13	18 26 1.92	2.6921	22 32 34.5	1.682	13	20 33 42.36	2.5766	20 43 7.2	6.009
14	18 28 43.48	2.6931	22 34 10.4	1.515	14	20 36 16.80	2.5714	20 37 2.5	6.147
15	18 31 25.09	2.6938	22 35 36.3	1.347	15	20 38 50.93	2.5661	20 30 49.5	6.285
16	18 34 6.74	2.6945	22 36 52.0	1.177	16	20 41 24.73	2.5607	20 24 28.3	6.422
17	18 36 48.43	2.6950	22 37 57.6	1.009	17	20 43 58.21	2.5552	20 17 58.9	6.557
18	18 39 30.14	2.6952	22 38 53.1	0.841	18	20 46 31.35	2.5497	20 11 21.5	6.689
19	18 42 11.86	2.6954	22 39 38.5	0.672	19	20 49 4.17	2.5442	20 4 36.2	6.821
20	18 44 53.59	2.6955	22 40 13.8	0.503	20	20 51 36.65	2.5384	19 57 43.0	6.952
21	18 47 35.32	2.6954	22 40 38.9	0.334	21	20 54 8.78	2.5327	19 50 42.0	7.082
22	18 50 17.04	2.6952	22 40 53.9	-0.166	22	20 56 40.57	2.5270	19 43 33.2	7.209
23	18 52 58.74	2.6947	22 40 58.8	+0.003	23	20 59 12.02	2.5212	19 36 16.9	7.335
24	18 55 40.40	2.6941	S. 22 40 53.5	0.172	24	21 1 43.12	2.5153	S. 19 28 53.0	7.460

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 9.					WEDNESDAY 11.				
0	21 1 43.12	2.5153	S. 19 28 53.0	7.460	0	22 55 26.50	2.2281	S. 11 35 47.4	11.672
1	21 4 13.86	2.5094	19 21 21.7	7.583	1	22 57 40.02	2.2227	11 24 5.5	11.733
2	21 6 44.25	2.5035	19 13 43.0	7.706	2	22 59 53.23	2.2176	11 12 20.6	11.773
3	21 9 14.28	2.4976	19 5 57.0	7.826	3	23 2 6.13	2.2124	11 0 32.7	11.822
4	21 11 43.95	2.4916	18 58 3.9	7.944	4	23 4 18.72	2.2072	10 48 41.9	11.870
5	21 14 13.27	2.4855	18 50 3.7	8.062	5	23 6 31.00	2.2022	10 36 48.3	11.916
6	21 16 42.22	2.4794	18 41 56.5	8.177	6	23 8 42.99	2.1972	10 24 52.0	11.961
7	21 19 10.80	2.4733	18 33 42.4	8.292	7	23 10 54.67	2.1922	10 12 53.0	12.005
8	21 21 39.01	2.4672	18 25 21.4	8.405	8	23 13 6.06	2.1874	10 0 51.4	12.047
9	21 24 6.86	2.4611	18 16 53.8	8.516	9	23 15 17.16	2.1826	9 48 47.3	12.088
10	21 26 34.34	2.4548	18 8 19.5	8.627	10	23 17 27.97	2.1778	9 36 40.8	12.128
11	21 29 1.44	2.4487	17 59 38.6	8.735	11	23 19 38.50	2.1731	9 24 31.9	12.167
12	21 31 28.18	2.4425	17 50 51.3	8.842	12	23 21 48.74	2.1683	9 12 20.7	12.204
13	21 33 54.54	2.4362	17 41 57.6	8.947	13	23 23 58.70	2.1637	9 0 7.4	12.240
14	21 36 20.53	2.4300	17 32 57.7	9.050	14	23 26 8.39	2.1592	8 47 51.9	12.275
15	21 38 46.14	2.4237	17 23 51.6	9.152	15	23 28 17.80	2.1547	8 35 34.4	12.307
16	21 41 11.38	2.4176	17 14 39.5	9.252	16	23 30 26.95	2.1502	8 23 15.0	12.340
17	21 43 36.25	2.4114	17 5 21.3	9.352	17	23 32 35.83	2.1459	8 10 53.6	12.371
18	21 46 0.75	2.4052	16 55 57.2	9.449	18	23 34 44.46	2.1417	7 58 30.5	12.400
19	21 48 24.87	2.3988	16 46 27.4	9.545	19	23 36 52.83	2.1373	7 46 5.6	12.429
20	21 50 48.61	2.3927	16 36 51.8	9.640	20	23 39 0.94	2.1332	7 33 39.0	12.457
21	21 53 11.99	2.3865	16 27 10.6	9.732	21	23 41 8.81	2.1291	7 21 10.8	12.482
22	21 55 34.99	2.3802	16 17 23.9	9.824	22	23 43 16.43	2.1251	7 8 41.1	12.507
23	21 57 57.61	2.3740	S. 16 7 31.7	9.914	23	23 45 23.82	2.1212	S. 6 56 9.9	12.532
TUESDAY 10.					THURSDAY 12.				
0	22 0 19.87	2.3679	S. 15 57 34.2	10.002	0	23 47 30.97	2.1172	S. 6 43 37.3	12.554
1	22 2 41.76	2.3617	15 47 31.5	10.088	1	23 49 37.88	2.1133	6 31 3.4	12.575
2	22 5 3.27	2.3555	15 37 23.6	10.174	2	23 51 44.57	2.1097	6 18 28.3	12.595
3	22 7 24.42	2.3494	15 27 10.6	10.257	3	23 53 51.04	2.1059	6 5 52.0	12.615
4	22 9 45.20	2.3432	15 16 52.7	10.339	4	23 55 57.28	2.1022	5 53 14.5	12.633
5	22 12 5.61	2.3372	15 6 29.9	10.420	5	23 58 3.30	2.0987	5 40 36.0	12.649
6	22 14 25.66	2.3312	14 56 2.3	10.500	6	0 0 9.12	2.0952	5 27 56.6	12.665
7	22 16 45.35	2.3252	14 45 29.9	10.577	7	0 2 14.72	2.0917	5 15 16.2	12.680
8	22 19 4.68	2.3191	14 34 53.0	10.652	8	0 4 20.12	2.0883	5 2 35.0	12.693
9	22 21 23.64	2.3131	14 24 11.6	10.727	9	0 6 25.32	2.0850	4 49 53.0	12.707
10	22 23 42.25	2.3072	14 13 25.7	10.801	10	0 8 30.32	2.0817	4 37 10.2	12.718
11	22 26 0.50	2.3012	14 2 35.5	10.872	11	0 10 35.13	2.0786	4 24 26.8	12.727
12	22 28 18.40	2.2954	13 51 41.0	10.942	12	0 12 39.75	2.0755	4 11 42.9	12.737
13	22 30 35.95	2.2896	13 40 42.4	11.011	13	0 14 44.19	2.0725	3 58 58.4	12.745
14	22 32 53.15	2.2837	13 29 39.7	11.078	14	0 16 48.45	2.0695	3 46 13.5	12.752
15	22 35 10.00	2.2776	13 18 33.0	11.144	15	0 18 52.53	2.0666	3 33 28.2	12.758
16	22 37 26.51	2.2722	13 7 22.4	11.208	16	0 20 56.44	2.0637	3 20 42.5	12.763
17	22 39 42.67	2.2666	12 56 8.0	11.272	17	0 23 0.18	2.0610	3 7 56.6	12.767
18	22 41 58.50	2.2610	12 44 49.8	11.333	18	0 25 3.76	2.0583	2 55 10.5	12.770
19	22 44 13.99	2.2554	12 33 28.0	11.392	19	0 27 7.18	2.0557	2 42 24.2	12.772
20	22 46 29.15	2.2498	12 22 2.7	11.451	20	0 29 10.44	2.0531	2 29 37.8	12.773
21	22 48 43.97	2.2443	12 10 33.9	11.508	21	0 31 13.55	2.0506	2 16 51.4	12.772
22	22 50 58.47	2.2390	11 59 1.7	11.565	22	0 33 16.51	2.0482	2 4 5.1	12.772
23	22 53 12.65	2.2336	11 47 26.1	11.619	23	0 35 19.33	2.0458	1 51 18.8	12.770
24	22 55 26.50	2.2281	S. 11 35 47.4	11.672	24	0 37 22.01	2.0436	S. 1 38 32.7	12.767



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 13.					SUNDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	37 22.01	2.0436	S. 1 38 32.7	12.767	0	2 14 0.50	2.0057	N. 8 13 16.3	11.559
1	39 24.56	2.0413	1 25 46.8	12.762	1	2 16 0.86	2.0063	8 24 48.5	11.513
2	41 26.97	2.0391	1 13 1.2	12.757	2	2 18 1.26	2.0069	8 36 17.9	11.467
3	43 29.25	2.0370	1 0 15.9	12.752	3	2 20 1.69	2.0075	8 47 44.5	11.420
4	45 31.41	2.0350	0 47 31.0	12.745	4	2 22 2.16	2.0082	8 59 8.3	11.372
5	47 33.45	2.0330	0 34 46.5	12.737	5	2 24 2.67	2.0089	9 10 29.1	11.322
6	49 35.37	2.0311	0 22 2.6	12.728	6	2 26 3.23	2.0097	9 21 47.0	11.273
7	51 37.18	2.0292	S. 0 9 19.2	12.719	7	2 28 3.84	2.0106	9 33 1.9	11.223
8	53 38.88	2.0275	N. 0 3 23.7	12.708	8	2 30 4.50	2.0114	9 44 13.8	11.172
9	55 40.48	2.0257	0 16 5.8	12.696	9	2 32 5.21	2.0122	9 55 22.5	11.119
10	57 41.97	2.0241	0 28 47.2	12.683	10	2 34 5.97	2.0132	10 6 28.1	11.067
11	59 43.37	2.0226	0 41 27.8	12.669	11	2 36 6.80	2.0142	10 17 30.5	11.013
12	1 44.68	2.0211	0 54 7.5	12.655	12	2 38 7.68	2.0152	10 28 29.7	10.959
13	1 3 45.90	2.0196	1 6 46.4	12.640	13	2 40 8.62	2.0162	10 39 25.6	10.904
14	1 5 47.03	2.0182	1 19 24.3	12.623	14	2 42 9.63	2.0174	10 50 18.2	10.848
15	1 7 48.08	2.0169	1 32 1.2	12.607	15	2 44 10.71	2.0185	11 1 7.4	10.792
16	1 9 49.06	2.0157	1 44 37.1	12.588	16	2 46 11.85	2.0196	11 11 53.2	10.734
17	1 11 49.96	2.0144	1 57 11.8	12.569	17	2 48 13.06	2.0208	11 22 35.5	10.676
18	1 13 50.79	2.0132	2 9 45.4	12.550	18	2 50 14.35	2.0222	11 33 14.3	10.617
19	1 15 51.55	2.0122	2 22 17.8	12.529	19	2 52 15.72	2.0234	11 43 49.6	10.558
20	1 17 52.25	2.0112	2 34 48.9	12.507	20	2 54 17.16	2.0247	11 54 21.3	10.497
21	1 19 52.89	2.0102	2 47 18.7	12.485	21	2 56 18.68	2.0260	12 4 49.3	10.437
22	1 21 53.48	2.0093	2 59 47.1	12.462	22	2 58 20.28	2.0273	12 15 13.7	10.375
23	1 23 54.01	2.0085	N. 3 12 14.1	12.437	23	3 0 21.96	2.0287	N. 12 25 34.3	10.312
SATURDAY 14.					MONDAY 16.				
0	1 25 54.50	2.0077	N. 3 24 39.6	12.412	0	3 2 23.73	2.0302	N. 12 35 51.1	10.248
1	1 27 54.94	2.0070	3 37 3.5	12.386	1	3 4 25.58	2.0317	12 46 4.1	10.185
2	1 29 55.34	2.0063	3 49 25.9	12.360	2	3 6 27.53	2.0332	12 56 13.3	10.120
3	1 31 55.70	2.0057	4 1 46.7	12.332	3	3 8 29.56	2.0346	13 6 18.5	10.054
4	1 33 56.02	2.0052	4 14 5.8	12.303	4	3 10 31.68	2.0362	13 16 19.8	9.988
5	1 35 56.32	2.0047	4 26 23.1	12.273	5	3 12 33.90	2.0377	13 26 17.1	9.922
6	1 37 56.59	2.0043	4 38 38.6	12.243	6	3 14 36.21	2.0392	13 36 10.4	9.854
7	1 39 56.84	2.0039	4 50 52.3	12.213	7	3 16 38.61	2.0409	13 45 59.6	9.785
8	1 41 57.06	2.0036	5 3 4.2	12.182	8	3 18 41.12	2.0426	13 55 44.6	9.716
9	1 43 57.27	2.0033	5 15 14.1	12.148	9	3 20 43.72	2.0442	14 5 25.5	9.647
10	1 45 57.46	2.0031	5 27 22.0	12.114	10	3 22 46.42	2.0458	14 15 2.2	9.576
11	1 47 57.64	2.0030	5 39 27.8	12.080	11	3 24 49.22	2.0475	14 24 34.6	9.504
12	1 49 57.82	2.0029	5 51 31.6	12.045	12	3 26 52.12	2.0492	14 34 2.7	9.432
13	1 51 57.99	2.0028	6 3 33.2	12.009	13	3 28 55.13	2.0510	14 43 26.5	9.360
14	1 53 58.16	2.0029	6 15 32.7	11.972	14	3 30 58.24	2.0527	14 52 45.9	9.287
15	1 55 58.34	2.0030	6 27 29.9	11.935	15	3 33 1.45	2.0544	15 2 0.9	9.212
16	1 57 58.52	2.0031	6 39 24.9	11.897	16	3 35 4.77	2.0562	15 11 11.4	9.137
17	1 59 58.71	2.0032	6 51 17.5	11.857	17	3 37 8.20	2.0581	15 20 17.4	9.062
18	2 1 58.91	2.0034	7 3 7.7	11.817	18	3 39 11.74	2.0599	15 29 18.9	8.987
19	2 3 59.12	2.0037	7 14 55.5	11.776	19	3 41 15.39	2.0617	15 38 15.8	8.909
20	2 5 59.35	2.0040	7 26 40.8	11.734	20	3 43 19.14	2.0634	15 47 8.0	8.832
21	2 7 59.60	2.0043	7 38 23.6	11.692	21	3 45 23.00	2.0653	15 55 55.6	8.754
22	2 9 59.87	2.0047	7 50 3.8	11.648	22	3 47 26.98	2.0672	16 4 38.5	8.676
23	2 12 0.17	2.0052	8 1 41.4	11.604	23	3 49 31.06	2.0690	16 13 16.7	8.596
24	2 14 0.50	2.0057	N. 8 13 16.3	11.559	24	3 51 35.26	2.0709	N. 16 21 50.0	8.515

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 17.					THURSDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	3 51 35.26	2.0709	N.16 21 50.0	8.515	0	5 33 1.52	2.1490	N.21 27 5.7	4.009
1	3 53 39.57	2.0727	16 30 18.5	8.435	1	5 35 10.49	2.1499	21 31 3.1	3.905
2	3 55 43.99	2.0746	16 38 42.2	8.354	2	5 37 19.51	2.1508	21 34 54.3	3.800
3	3 57 48.52	2.0765	16 47 1.0	8.272	3	5 39 28.59	2.1518	21 38 39.1	3.694
4	3 59 53.17	2.0784	16 55 14.8	8.188	4	5 41 37.73	2.1527	21 42 17.6	3.589
5	4 1 57.93	2.0802	17 3 23.6	8.105	5	5 43 46.92	2.1536	21 45 49.8	3.484
6	4 4 2.80	2.0821	17 11 27.4	8.021	6	5 45 56.16	2.1543	21 49 15.7	3.378
7	4 6 7.78	2.0840	17 19 26.1	7.937	7	5 48 5.44	2.1550	21 52 35.2	3.272
8	4 8 12.88	2.0859	17 27 19.8	7.852	8	5 50 14.76	2.1557	21 55 48.3	3.164
9	4 10 18.09	2.0877	17 35 8.3	7.766	9	5 52 24.13	2.1565	21 58 54.9	3.058
10	4 12 23.41	2.0896	17 42 51.7	7.679	10	5 54 33.54	2.1572	22 1 55.2	2.952
11	4 14 28.84	2.0915	17 50 29.8	7.592	11	5 56 42.99	2.1577	22 4 49.1	2.844
12	4 16 34.39	2.0934	17 58 2.7	7.504	12	5 58 52.47	2.1582	22 7 36.5	2.737
13	4 18 40.05	2.0952	18 5 30.3	7.416	13	6 1 1.98	2.1587	22 10 17.5	2.629
14	4 20 45.82	2.0971	18 12 52.6	7.327	14	6 3 11.52	2.1592	22 12 52.0	2.522
15	4 22 51.70	2.0989	18 20 9.6	7.238	15	6 5 21.09	2.1597	22 15 20.1	2.414
16	4 24 57.69	2.1007	18 27 21.2	7.148	16	6 7 30.68	2.1600	22 17 41.7	2.307
17	4 27 3.79	2.1026	18 34 27.4	7.057	17	6 9 40.29	2.1603	22 19 56.9	2.198
18	4 29 10.00	2.1043	18 41 28.1	6.967	18	6 11 49.92	2.1606	22 22 5.5	2.090
19	4 31 16.31	2.1062	18 48 23.4	6.875	19	6 13 59.56	2.1607	22 24 7.7	1.982
20	4 33 22.74	2.1080	18 55 13.1	6.782	20	6 16 9.21	2.1609	22 26 3.3	1.873
21	4 35 29.27	2.1097	19 1 57.3	6.690	21	6 18 18.87	2.1611	22 27 52.5	1.765
22	4 37 35.91	2.1115	19 8 35.9	6.597	22	6 20 28.54	2.1612	22 29 35.1	1.657
23	4 39 42.65	2.1132	N.19 15 8.9	6.502	23	6 22 38.21	2.1612	N.22 31 11.3	1.548
WEDNESDAY 18.					FRIDAY 20.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	4 41 49.50	2.1150	N.19 21 36.2	6.408	0	6 24 47.88	2.1612	N.22 32 40.9	1.439
1	4 43 56.45	2.1167	19 27 57.9	6.314	1	6 26 57.55	2.1611	22 34 4.0	1.331
2	4 46 3.50	2.1184	19 34 13.9	6.218	2	6 29 7.21	2.1609	22 35 20.6	1.222
3	4 48 10.66	2.1201	19 40 24.1	6.122	3	6 31 16.86	2.1607	22 36 30.6	1.113
4	4 50 17.91	2.1217	19 46 28.5	6.026	4	6 33 26.50	2.1606	22 37 34.2	1.005
5	4 52 25.26	2.1232	19 52 27.2	5.929	5	6 35 36.13	2.1603	22 38 31.2	0.896
6	4 54 32.70	2.1249	19 58 20.0	5.832	6	6 37 45.74	2.1600	22 39 21.7	0.787
7	4 56 40.25	2.1266	20 4 7.0	5.734	7	6 39 55.33	2.1597	22 40 5.7	0.678
8	4 58 47.89	2.1281	20 9 48.1	5.636	8	6 42 4.90	2.1593	22 40 43.1	0.569
9	5 0 55.62	2.1296	20 15 23.3	5.538	9	6 44 14.44	2.1588	22 41 14.0	0.462
10	5 3 3.44	2.1311	20 20 52.6	5.438	10	6 46 23.95	2.1582	22 41 38.5	0.353
11	5 5 11.35	2.1326	20 26 15.9	5.338	11	6 48 33.43	2.1577	22 41 56.4	0.244
12	5 7 19.35	2.1341	20 31 33.2	5.238	12	6 50 42.88	2.1572	22 42 7.8	0.136
13	5 9 27.44	2.1355	20 36 44.5	5.138	13	6 52 52.29	2.1565	22 42 12.7	+ 0.027
14	5 11 35.61	2.1368	20 41 49.8	5.037	14	6 55 1.66	2.1557	22 42 11.1	- 0.080
15	5 13 43.86	2.1382	20 46 49.0	4.937	15	6 57 10.98	2.1549	22 42 3.1	0.188
16	5 15 52.19	2.1395	20 51 42.2	4.835	16	6 59 20.25	2.1542	22 41 48.5	0.297
17	5 18 0.60	2.1408	20 56 29.2	4.732	17	7 1 29.48	2.1533	22 41 27.5	0.404
18	5 20 9.09	2.1421	21 1 10.1	4.631	18	7 3 38.65	2.1524	22 41 0.0	0.512
19	5 22 17.65	2.1433	21 5 44.9	4.528	19	7 5 47.77	2.1516	22 40 26.1	0.619
20	5 24 26.29	2.1446	21 10 13.5	4.425	20	7 7 56.84	2.1506	22 39 45.7	0.727
21	5 26 35.00	2.1457	21 14 35.9	4.321	21	7 10 5.84	2.1495	22 38 58.9	0.834
22	5 28 43.77	2.1467	21 18 52.0	4.217	22	7 12 14.78	2.1484	22 38 5.6	0.941
23	5 30 52.61	2.1479	21 23 2.0	4.114	23	7 14 23.65	2.1472	22 37 6.0	1.047
24	5 33 1.52	2.1490	N.21 27 5.7	4.009	24	7 16 32.45	2.1461	N.22 35 59.9	1.155

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 21.					MONDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	7 16 32.45	2.1461	N.22 35 59.9	1.155	0	8 57 30.61	2.0506	N.19 43 42.7	5.870
1	7 18 41.18	2.1449	22 34 47.4	1.261	1	8 59 33.57	2.0481	19 37 47.9	5.957
2	7 20 49.84	2.1437	22 33 28.6	1.367	2	9 1 36.38	2.0456	19 31 47.9	6.043
3	7 22 58.42	2.1423	22 32 3.4	1.472	3	9 3 39.04	2.0431	19 25 42.7	6.130
4	7 25 6.92	2.1410	22 30 31.9	1.578	4	9 5 41.55	2.0406	19 19 32.3	6.216
5	7 27 15.34	2.1396	22 28 54.0	1.684	5	9 7 43.91	2.0381	19 13 16.8	6.301
6	7 29 23.67	2.1382	22 27 9.8	1.789	6	9 9 46.12	2.0357	19 6 56.2	6.385
7	7 31 31.92	2.1367	22 25 19.3	1.894	7	9 11 48.19	2.0332	19 0 30.6	6.468
8	7 33 40.08	2.1352	22 23 22.5	1.998	8	9 13 50.10	2.0307	18 54 0.0	6.552
9	7 35 48.15	2.1337	22 21 19.5	2.102	9	9 15 51.87	2.0282	18 47 24.3	6.636
10	7 37 56.12	2.1321	22 19 10.2	2.207	10	9 17 53.49	2.0257	18 40 43.7	6.717
11	7 40 4.00	2.1305	22 16 54.7	2.311	11	9 19 54.96	2.0233	18 33 58.2	6.799
12	7 42 11.78	2.1288	22 14 32.9	2.415	12	9 21 56.29	2.0209	18 27 7.8	6.881
13	7 44 19.46	2.1271	22 12 4.9	2.517	13	9 23 57.47	2.0184	18 20 12.5	6.962
14	7 46 27.03	2.1253	22 9 30.8	2.620	14	9 25 58.50	2.0159	18 13 12.4	7.042
15	7 48 34.50	2.1236	22 6 50.5	2.722	15	9 27 59.38	2.0134	18 6 7.5	7.121
16	7 50 41.86	2.1217	22 4 4.1	2.825	16	9 30 0.11	2.0110	17 58 57.9	7.200
17	7 52 49.11	2.1199	22 1 11.5	2.927	17	9 32 0.70	2.0087	17 51 43.5	7.279
18	7 54 56.25	2.1180	21 58 12.9	3.027	18	9 34 1.15	2.0062	17 44 24.4	7.357
19	7 57 3.27	2.1161	21 55 8.2	3.129	19	9 36 1.45	2.0038	17 37 0.7	7.433
20	7 59 10.18	2.1142	21 51 57.4	3.230	20	9 38 1.61	2.0015	17 29 32.4	7.511
21	8 1 16.98	2.1122	21 48 40.6	3.330	21	9 40 1.63	1.9991	17 21 59.4	7.587
22	8 3 23.65	2.1102	21 45 17.8	3.430	22	9 42 1.50	1.9967	17 14 21.9	7.662
23	8 5 30.21	2.1082	N.21 41 49.0	3.529	23	9 44 1.24	1.9944	N.17 6 39.9	7.737
SUNDAY 22.					TUESDAY 24.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 7 36.64	2.1062	N.21 38 14.3	3.628	0	9 46 0.83	1.9920	N.16 58 53.4	7.812
1	8 9 42.95	2.1041	21 34 33.6	3.727	1	9 48 0.28	1.9897	16 51 2.5	7.886
2	8 11 49.13	2.1019	21 30 47.1	3.825	2	9 49 59.60	1.9875	16 43 7.1	7.960
3	8 13 55.18	2.0998	21 26 54.6	3.923	3	9 51 58.78	1.9852	16 35 7.3	8.032
4	8 16 1.11	2.0977	21 22 56.3	4.020	4	9 53 57.82	1.9829	16 27 3.2	8.105
5	8 18 6.90	2.0954	21 18 52.2	4.117	5	9 55 56.73	1.9807	16 18 54.7	8.177
6	8 20 12.56	2.0932	21 14 42.2	4.214	6	9 57 55.51	1.9786	16 10 42.0	8.247
7	8 22 18.09	2.0910	21 10 26.5	4.310	7	9 59 54.16	1.9763	16 2 25.0	8.318
8	8 24 23.48	2.0887	21 6 5.0	4.406	8	10 1 52.67	1.9742	15 54 3.8	8.388
9	8 26 28.74	2.0865	21 1 37.8	4.500	9	10 3 51.06	1.9721	15 45 38.4	8.457
10	8 28 33.86	2.0842	20 57 5.0	4.595	10	10 5 49.32	1.9700	15 37 8.9	8.527
11	8 30 38.85	2.0819	20 52 26.4	4.690	11	10 7 47.46	1.9679	15 28 35.2	8.595
12	8 32 43.69	2.0795	20 47 42.2	4.783	12	10 9 45.47	1.9658	15 19 57.5	8.662
13	8 34 48.39	2.0772	20 42 52.4	4.877	13	10 11 43.36	1.9638	15 11 15.7	8.729
14	8 36 52.95	2.0748	20 37 57.0	4.969	14	10 13 41.13	1.9618	15 2 30.0	8.796
15	8 38 57.37	2.0725	20 32 56.1	5.062	15	10 15 38.78	1.9599	14 53 40.2	8.862
16	8 41 1.65	2.0701	20 27 49.6	5.154	16	10 17 36.31	1.9579	14 44 46.5	8.927
17	8 43 5.78	2.0677	20 22 37.6	5.245	17	10 19 33.73	1.9560	14 35 48.9	8.992
18	8 45 9.77	2.0652	20 17 20.2	5.335	18	10 21 31.03	1.9541	14 26 47.4	9.057
19	8 47 13.61	2.0627	20 11 57.4	5.426	19	10 23 28.22	1.9522	14 17 42.1	9.121
20	8 49 17.30	2.0603	20 6 29.1	5.516	20	10 25 25.30	1.9504	14 8 32.9	9.184
21	8 51 20.85	2.0579	20 0 55.5	5.605	21	10 27 22.27	1.9487	13 59 20.0	9.246
22	8 53 24.25	2.0554	19 55 16.5	5.693	22	10 29 19.14	1.9470	13 50 3.4	9.308
23	8 55 27.50	2.0530	19 49 32.3	5.782	23	10 31 15.91	1.9452	13 40 43.0	9.370
24	8 57 30.61	2.0506	N.19 43 42.7	5.870	24	10 33 12.57	1.9435	N.13 31 19.0	9.430

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 25.					FRIDAY 27.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
1	10 33 12.57	1.9435	13 31 19.0	9.430	1	12 5 24.10	1.9172	4 59 28.0	11.672
2	10 35 9.13	1.9419	13 21 51.4	9.491	2	12 7 19.16	1.9180	4 47 46.7	11.704
3	10 37 5.60	1.9403	13 12 20.1	9.551	3	12 9 14.26	1.9188	4 36 3.5	11.736
4	10 39 1.97	1.9387	13 2 45.3	9.609	4	12 11 9.42	1.9197	4 24 18.4	11.767
5	10 40 58.25	1.9372	12 53 7.0	9.667	5	12 13 4.63	1.9207	4 12 31.5	11.797
6	10 42 54.44	1.9357	12 43 25.2	9.726	6	12 14 59.90	1.9217	4 0 42.8	11.826
7	10 44 50.54	1.9343	12 33 39.9	9.783	7	12 16 55.24	1.9229	3 48 52.4	11.855
8	10 46 46.56	1.9330	12 23 51.2	9.841	8	12 18 50.65	1.9240	3 37 0.2	11.883
9	10 48 42.50	1.9316	12 13 59.0	9.897	9	12 20 46.12	1.9252	3 25 6.4	11.911
10	10 50 38.35	1.9302	12 4 3.6	9.952	10	12 22 41.67	1.9266	3 13 10.9	11.937
11	10 52 34.12	1.9289	11 54 4.8	10.007	11	12 24 37.31	1.9280	3 1 13.9	11.963
12	10 54 29.82	1.9277	11 44 2.7	10.062	12	12 26 33.03	1.9293	2 49 15.3	11.989
13	10 56 25.45	1.9266	11 33 57.3	10.117	13	12 28 28.83	1.9308	2 37 15.2	12.014
14	10 58 21.01	1.9254	11 23 48.7	10.169	14	12 30 24.73	1.9324	2 25 13.6	12.037
15	11 0 16.50	1.9242	11 13 37.0	10.222	15	12 32 20.72	1.9340	2 13 10.7	12.061
16	11 2 11.92	1.9232	11 3 22.1	10.275	16	12 34 16.81	1.9357	2 1 6.3	12.085
17	11 4 7.28	1.9222	10 53 4.0	10.327	17	12 36 13.01	1.9375	1 49 0.5	12.107
18	11 6 2.58	1.9212	10 42 42.9	10.377	18	12 38 9.31	1.9393	1 36 53.5	12.127
19	11 7 57.83	1.9203	10 32 18.7	10.428	19	12 40 5.72	1.9412	1 24 45.3	12.147
20	11 9 53.02	1.9195	10 21 51.5	10.477	20	12 42 2.25	1.9432	1 12 35.8	12.168
21	11 11 48.17	1.9187	10 11 21.4	10.527	21	12 43 58.90	1.9452	1 0 25.1	12.187
22	11 13 43.26	1.9178	10 0 48.3	10.576	22	12 45 55.67	1.9472	0 48 13.3	12.206
23	11 15 38.31	1.9171	9 50 12.3	10.624	23	12 47 52.57	1.9494	0 36 0.4	12.223
24	11 17 33.31	1.9164	N. 9 39 33.4	10.672	24	12 49 49.60	1.9517	N. 0 23 46.5	12.240
THURSDAY 26.					SATURDAY 28.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
1	11 19 28.28	1.9158	9 28 51.6	10.720	1	12 51 46.77	1.9540	0 11 31.6	12.256
2	11 21 23.21	1.9152	9 18 7.0	10.766	2	12 53 44.08	1.9563	0 0 44.2	12.272
3	11 23 18.11	1.9147	9 7 19.7	10.812	3	12 55 41.53	1.9588	0 13 1.0	12.287
4	11 25 12.98	1.9142	8 56 29.6	10.857	4	12 57 39.14	1.9613	0 25 18.6	12.300
5	11 27 7.82	1.9137	8 45 36.8	10.902	5	12 59 36.89	1.9638	0 37 37.0	12.313
6	11 29 2.63	1.9134	8 34 41.4	10.946	6	13 1 34.80	1.9665	0 49 56.2	12.326
7	11 30 57.43	1.9132	8 23 43.3	10.990	7	13 3 32.87	1.9692	1 2 16.1	12.337
8	11 32 52.21	1.9129	8 12 42.6	11.033	8	13 5 31.11	1.9721	1 14 36.7	12.348
9	11 34 46.98	1.9127	8 1 39.4	11.075	9	13 7 29.52	1.9749	1 26 57.9	12.357
10	11 36 41.73	1.9125	7 50 33.6	11.118	10	13 9 28.10	1.9778	1 39 19.6	12.367
11	11 38 36.48	1.9125	7 39 25.3	11.158	11	13 11 26.86	1.9808	1 51 41.9	12.376
12	11 40 31.23	1.9124	7 28 14.6	11.199	12	13 13 25.80	1.9839	2 4 4.7	12.382
13	11 42 25.97	1.9124	7 17 1.4	11.239	13	13 15 24.93	1.9871	2 16 27.8	12.388
14	11 44 20.72	1.9125	7 5 45.9	11.278	14	13 17 24.25	1.9902	2 28 51.3	12.394
15	11 46 15.47	1.9126	6 54 28.0	11.317	15	13 19 23.76	1.9935	2 41 15.1	12.399
16	11 48 10.23	1.9127	6 43 7.8	11.356	16	13 21 23.47	1.9969	2 53 39.2	12.403
17	11 50 5.00	1.9130	6 31 45.3	11.393	17	13 23 23.39	2.0004	3 6 3.5	12.407
18	11 51 59.79	1.9133	6 20 20.6	11.430	18	13 25 23.52	2.0039	3 18 28.0	12.409
19	11 53 54.60	1.9137	6 8 53.7	11.467	19	13 27 23.86	2.0074	3 30 52.6	12.410
20	11 55 49.44	1.9142	5 57 24.6	11.502	20	13 29 24.41	2.0111	3 43 17.2	12.410
21	11 57 44.30	1.9146	5 45 53.4	11.537	21	13 31 25.19	2.0148	3 55 41.8	12.409
22	11 59 39.19	1.9152	5 34 20.1	11.572	22	13 33 26.19	2.0186	4 8 6.3	12.407
23	12 1 34.12	1.9158	5 22 44.8	11.606	23	13 35 27.42	2.0225	4 20 30.7	12.405
24	12 3 29.09	1.9165	5 11 7.4	11.640	24	13 37 28.89	2.0265	4 32 54.9	12.402
	12 5 24.10	1.9172	N. 4 59 28.0	11.672		13 39 30.60	2.0305	S. 4 45 18.9	12.397

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 29.					TUESDAY 31.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	13 39 30.60	2.0305	S. 4 45 18.9	12.397	1	15 22 53.76	2.3010	S. 14 13 40.4	10.787
2	13 41 32.55	2.0345	4 57 42.6	12.392	2	15 25 12.03	2.3080	14 24 25.6	10.719
3	13 43 34.74	2.0387	5 10 5.9	12.385	3	15 27 30.72	2.3150	14 35 6.7	10.649
4	13 45 37.19	2.0430	5 22 28.8	12.377	4	15 29 49.83	2.3220	14 45 43.5	10.578
5	13 47 39.90	2.0472	5 34 51.2	12.368	5	15 32 9.36	2.3290	14 56 16.1	10.507
6	13 49 42.86	2.0516	5 47 13.0	12.359	6	15 34 29.31	2.3362	15 6 44.3	10.432
7	13 51 46.09	2.0560	5 59 34.3	12.349	7	15 36 49.70	2.3433	15 17 7.9	10.355
8	13 53 49.58	2.0605	6 11 54.9	12.337	8	15 39 10.51	2.3504	15 27 26.9	10.277
9	13 55 53.35	2.0652	6 24 14.8	12.324	9	15 41 31.75	2.3576	15 37 41.2	10.198
10	13 57 57.40	2.0698	6 36 33.8	12.310	10	15 43 53.42	2.3647	15 47 50.7	10.117
11	14 0 1.73	2.0745	6 48 52.0	12.296	11	15 46 15.52	2.3719	15 57 55.3	10.035
12	14 2 6.34	2.0792	7 1 9.3	12.280	12	15 48 38.05	2.3792	16 7 54.9	9.950
13	14 4 11.24	2.0842	7 13 25.6	12.262	13	15 51 1.02	2.3864	16 17 49.3	9.865
14	14 6 16.44	2.0891	7 25 40.8	12.244	14	15 53 24.42	2.3937	16 27 38.5	9.776
15	14 8 21.93	2.0941	7 37 54.9	12.225	15	15 55 48.26	2.4009	16 37 22.4	9.687
16	14 10 27.73	2.0992	7 50 7.8	12.204	16	15 58 12.53	2.4082	16 47 0.9	9.595
17	14 12 33.83	2.1043	8 2 19.4	12.183	17	16 0 37.24	2.4154	16 56 33.8	9.502
18	14 14 40.25	2.1096	8 14 29.7	12.160	18	16 3 2.38	2.4227	17 6 1.1	9.407
19	14 16 46.98	2.1148	8 26 38.6	12.136	19	16 5 27.96	2.4299	17 15 22.7	9.311
20	14 18 54.03	2.1202	8 38 46.0	12.110	20	16 7 53.97	2.4372	17 24 38.4	9.212
21	14 21 1.40	2.1255	8 50 51.8	12.083	21	16 10 20.42	2.4444	17 33 48.2	9.113
22	14 23 9.09	2.1310	9 2 56.0	12.056	22	16 12 47.30	2.4517	17 42 52.0	9.012
23	14 25 17.12	2.1366	9 14 58.5	12.027	23	16 15 14.62	2.4588	17 51 49.6	8.908
24	14 27 25.48	2.1422	S. 9 26 59.2	11.996	24	16 17 42.36	2.4660	S. 18 0 41.0	8.803
MONDAY 30.					WEDNESDAY, JANUARY 1, 1908.				
0	14 29 34.18	2.1478	S. 9 38 58.0	11.964	0	16 20 10.54	2.4732	S. 18 9 26.0	8.696
1	14 31 43.22	2.1536	9 50 54.9	11.932	PHASES OF THE MOON.				
2	14 33 52.61	2.1594	10 2 49.9	11.898					
3	14 36 2.35	2.1653	10 14 42.7	11.862					
4	14 38 12.45	2.1712	10 26 33.3	11.825					
5	14 40 22.90	2.1772	10 38 21.7	11.787					
6	14 42 33.71	2.1832	10 50 7.8	11.747					
7	14 44 44.89	2.1893	11 1 51.4	11.707					
8	14 46 56.43	2.1954	11 13 32.6	11.664					
9	14 49 8.34	2.2017	11 25 11.1	11.620					
10	14 51 20.63	2.2080	11 36 47.0	11.576					
11	14 53 33.30	2.2143	11 48 20.2	11.529					
12	14 55 46.35	2.2207	11 59 50.5	11.481					
13	14 57 59.78	2.2271	12 11 17.9	11.431					
14	15 0 13.60	2.2336	12 22 42.2	11.380					
15	15 2 27.81	2.2402	12 34 3.5	11.328					
16	15 4 42.42	2.2467	12 45 21.6	11.274					
17	15 6 57.42	2.2533	12 56 36.4	11.218					
18	15 9 12.82	2.2600	13 7 47.8	11.162					
19	15 11 28.62	2.2667	13 18 55.8	11.103					
20	15 13 44.83	2.2736	13 30 0.2	11.042					
21	15 16 1.45	2.2803	13 41 0.9	10.981					
22	15 18 18.47	2.2872	13 51 57.9	10.918					
23	15 20 35.91	2.2941	14 2 51.1	10.854					
24	15 22 53.76	2.3010	S. 14 13 40.4	10.787					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	Pollux	W.	84 13 54	2601	85 52 48	2583	87 32 7	2564	89 11 51	2546
	JUPITER	W.	63 10 28	2579	64 49 52	2561	66 29 41	2543	68 9 55	2524
	Regulus	W.	48 20 5	2588	49 59 17	2569	51 38 54	2551	53 18 57	2532
	SUN	E.	51 36 36	2931	50 4 56	2912	48 32 52	2893	47 0 24	2874
2	Pollux	W.	97 36 48	2457	99 19 2	2439	101 1 41	2422	102 44 44	2405
	JUPITER	W.	76 37 29	2433	78 20 16	2415	80 3 29	2398	81 47 7	2380
	Regulus	W.	61 45 38	2441	63 28 15	2423	65 11 17	2405	66 54 45	2387
	SUN	E.	39 11 55	2779	37 37 0	2762	36 1 42	2744	34 26 0	2726
7	SUN	W.	28 35 6	2394	30 18 49	2396	32 2 30	2398	33 46 8	2401
	SATURN	E.	68 1 17	2079	66 9 45	2083	64 18 19	2087	62 26 59	2091
	α Arietis	E.	113 8 50	2240	111 21 22	2239	109 33 52	2239	107 46 22	2240
8	SUN	W.	42 22 43	2429	44 5 36	2436	45 48 19	2444	47 30 51	2453
	SATURN	E.	53 12 26	2124	51 22 3	2132	49 31 52	2140	47 41 54	2149
	α Arietis	E.	98 49 45	2260	97 2 46	2266	95 15 56	2273	93 29 17	2281
9	SUN	W.	56 0 11	2504	57 41 19	2515	59 22 12	2526	61 2 49	2538
	SATURN	E.	38 35 43	2202	36 47 18	2214	34 59 10	2226	33 11 21	2239
	α Arietis	E.	84 39 19	2331	82 54 5	2343	81 9 9	2355	79 24 30	2368
	Aldebaran	E.	115 51 3	2187	114 2 16	2198	112 13 45	2209	110 25 30	2220
10	SUN	W.	69 21 39	2601	71 0 32	2615	72 39 7	2628	74 17 24	2642
	α Arietis	E.	70 46 15	2443	69 3 41	2460	67 21 31	2477	65 39 45	2494
	Aldebaran	E.	101 28 33	2279	99 42 3	2291	97 55 51	2304	96 9 57	2317
11	SUN	W.	82 24 11	2710	84 0 37	2725	85 36 44	2738	87 12 33	2752
	α Aquilæ	W.	51 11 34	3559	52 30 53	3517	53 50 58	3481	55 11 43	3449
	α Arietis	E.	57 17 19	2593	55 38 13	2615	53 59 38	2638	52 21 34	2662
	Aldebaran	E.	87 25 8	2381	85 41 6	2394	83 57 23	2407	82 13 58	2420
12	SUN	W.	95 7 5	2821	96 41 6	2834	98 14 49	2847	99 48 16	2861
	α Aquilæ	W.	62 3 1	3344	63 26 22	3332	64 49 57	3321	66 13 44	3312
	Aldebaran	E.	73 41 30	2484	71 59 54	2497	70 18 36	2509	68 37 35	2522
	Pollux	E.	117 49 17	2510	116 8 17	2522	114 27 34	2533	112 47 7	2545
13	SUN	W.	107 31 14	2926	109 3 0	2938	110 34 31	2950	112 5 46	2962
	α Aquilæ	W.	73 14 34	3294	74 38 53	3293	76 3 13	3294	77 27 31	3297
	MARS	W.	28 19 2	2840	29 52 38	2850	31 26 1	2860	32 59 11	2870
	Aldebaran	E.	60 16 48	2582	58 37 28	2594	56 58 25	2605	55 19 37	2616
	Pollux	E.	104 28 51	2602	102 49 59	2613	101 11 22	2624	99 33 0	2635
14	SUN	W.	119 38 18	3021	121 8 5	3032	122 37 38	3043	124 6 58	3054
	α Aquilæ	W.	84 27 58	3323	85 51 43	3330	87 15 20	3338	88 38 47	3348
	MARS	W.	40 41 51	2920	42 13 44	2930	43 45 25	2940	45 16 53	2950
	SATURN	W.	30 11 18	2693	31 48 7	2701	33 24 45	2710	35 1 11	2719
	Aldebaran	E.	47 9 25	2672	45 32 7	2683	43 55 4	2693	42 18 15	2704
	Pollux	E.	91 24 48	2688	89 47 53	2698	88 11 11	2708	86 34 42	2719
15	α Aquilæ	W.	95 33 9	3404	96 55 21	3418	98 17 17	3432	99 38 57	3448
	MARS	W.	52 51 10	2997	54 21 26	3007	55 51 30	3016	57 21 23	3025

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	Pollux	W.	90 52 0	2528	92 32 35	2510	94 13 34	2492	95 54 59	2475
	JUPITER	W.	69 50 35	2506	71 31 40	2488	73 13 11	2470	74 55 7	2451
	Regulus	W.	54 59 26	2513	56 40 21	2495	58 21 41	2477	60 3 26	2458
	SUN	E.	45 27 31	2855	43 54 14	2836	42 20 32	2817	40 46 26	2798
2	Pollux	W.	104 28 12	2389	106 12 3	2372	107 56 18	2355	109 40 57	2339
	JUPITER	W.	83 31 10	2363	85 15 38	2346	87 0 30	2329	88 45 47	2313
	Regulus	W.	68 38 38	2370	70 22 56	2353	72 7 38	2336	73 52 45	2320
	SUN	E.	32 49 55	2709	31 13 27	2693	29 36 38	2678	27 59 28	2662
7	SUN	W.	35 29 41	2405	37 13 8	2410	38 56 28	2416	40 39 40	2422
	SATURN	E.	60 35 46	2096	58 44 41	2102	56 53 46	2109	55 3 1	2116
	α Arietis	E.	105 58 54	2242	104 11 29	2245	102 24 8	2249	100 36 53	2254
8	SUN	W.	49 13 10	2462	50 55 16	2472	52 37 9	2482	54 18 47	2493
	SATURN	E.	45 52 9	2159	44 2 39	2169	42 13 24	2179	40 24 25	2190
	α Arietis	E.	91 42 50	2290	89 56 36	2299	88 10 35	2309	86 24 49	2320
9	SUN	W.	62 43 9	2550	64 23 13	2563	66 2 59	2575	67 42 28	2588
	SATURN	E.	31 23 51	2252	29 36 41	2266	27 49 51	2280	26 3 22	2295
	α Arietis	E.	77 40 10	2382	75 56 10	2396	74 12 30	2411	72 29 11	2427
	Aldebaran	E.	108 37 32	2231	106 49 51	2243	105 2 28	2255	103 15 22	2267
10	SUN	W.	75 55 22	2655	77 33 2	2669	79 10 23	2683	80 47 26	2696
	α Arietis	E.	63 58 23	2512	62 17 27	2531	60 36 57	2551	58 56 54	2571
	Aldebaran	E.	94 24 22	2330	92 39 6	2342	90 54 8	2355	89 9 29	2368
11	SUN	W.	88 48 4	2766	90 23 16	2780	91 58 10	2794	93 32 46	2807
	α Aquilæ	W.	56 33 4	3422	57 54 56	3398	59 17 15	3377	60 39 58	3359
	α Arietis	E.	50 44 3	2687	49 7 6	2713	47 30 44	2741	45 54 59	2770
	Aldebaran	E.	80 30 52	2433	78 48 4	2446	77 5 35	2459	75 23 24	2471
12	SUN	W.	101 21 25	2874	102 54 17	2887	104 26 52	2900	105 59 11	2913
	α Aquilæ	W.	67 37 42	3305	69 1 48	3300	70 25 59	3296	71 50 15	3294
	Aldebaran	E.	66 56 52	2534	65 16 26	2546	63 36 17	2558	61 56 24	2570
	Pollux	E.	111 6 56	2556	109 27 1	2568	107 47 22	2580	106 7 59	2591
13	SUN	W.	113 36 46	2974	115 7 31	2986	116 38 1	2997	118 8 17	3009
	α Aquilæ	W.	78 51 46	3300	80 15 57	3304	81 40 4	3310	83 4 5	3316
	MARS	W.	34 32 9	2880	36 4 54	2890	37 37 25	2900	39 9 44	2910
	Aldebaran	E.	53 41 4	2628	52 2 47	2639	50 24 45	2650	48 46 58	2661
	Pollux	E.	97 54 52	2646	96 16 59	2657	94 39 21	2667	93 1 57	2678
14	SUN	W.	125 36 4	3065	127 4 57	3075	128 33 37	3085	130 2 4	3095
	α Aquilæ	W.	90 2 3	3358	91 25 8	3369	92 48 2	3379	94 10 43	3391
	MARS	W.	46 48 9	2960	48 19 12	2969	49 50 3	2979	51 20 42	2988
	SATURN	W.	36 37 26	2728	38 13 28	2737	39 49 19	2746	41 24 57	2755
	Aldebaran	E.	40 41 40	2714	39 5 19	2724	37 29 11	2734	35 53 17	2744
	Pollux	E.	84 58 27	2729	83 22 25	2739	81 46 37	2748	80 11 1	2758
15	α Aquilæ	W.	101 0 19	3464	102 21 24	3480	103 42 10	3498	105 2 36	3517
	MARS	W.	58 51 4	3034	60 20 35	3043	61 49 54	3052	63 19 3	3060

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
15	SATURN W.	43 0 24	2764	44 35 39	2772	46 10 43	2781	47 45 36	2790
	Aldebaran E.	34 17 36	2755	32 42 9	2765	31 6 55	2775	29 31 55	2785
	Pollux E.	78 35 38	2767	77 0 27	2777	75 25 29	2786	73 50 43	2795
	JUPITER E.	99 13 15	2728	97 37 12	2737	96 1 21	2746	94 25 42	2755
	Regulus E.	114 25 33	2750	112 50 0	2759	111 14 39	2768	109 39 29	2777
16	α Aquilæ W.	106 22 42	3537	107 42 25	3557	109 1 46	3579	110 20 43	3603
	MARS W.	64 48 2	3069	66 16 50	3077	67 45 28	3086	69 13 55	3093
	α Pegasi W.	58 42 44	3372	60 5 32	3364	61 28 30	3356	62 51 38	3349
	SATURN W.	55 37 15	2830	57 11 3	2838	58 44 42	2846	60 18 10	2854
	Pollux E.	65 59 48	2840	64 26 12	2848	62 52 47	2857	61 19 33	2866
	JUPITER E.	86 30 20	2797	84 55 48	2805	83 21 26	2812	81 47 14	2819
	Regulus E.	101 46 28	2818	100 12 24	2826	98 38 30	2834	97 4 46	2842
17	MARS W.	76 33 48	3132	78 1 19	3140	79 28 40	3147	80 55 52	3155
	α Pegasi W.	69 48 50	3330	71 12 27	3328	72 36 6	3327	73 59 46	3328
	SATURN W.	68 3 4	2891	69 35 35	2898	71 7 56	2905	72 40 9	2912
	Pollux E.	53 36 10	2909	52 4 2	2918	50 32 6	2927	49 0 21	2935
	JUPITER E.	73 58 35	2855	72 25 19	2862	70 52 13	2869	69 19 15	2876
	Regulus E.	89 18 33	2879	87 45 47	2886	86 13 10	2893	84 40 42	2900
18	MARS W.	88 9 43	3190	89 36 4	3197	91 2 16	3204	92 28 20	3210
	α Pegasi W.	80 57 45	3338	82 21 12	3341	83 44 36	3345	85 7 55	3349
	SATURN W.	80 19 2	2946	81 50 23	2952	83 21 36	2958	84 52 41	2964
	α Arietis W.	37 19 38	3338	38 43 6	3318	40 6 57	3301	41 31 7	3286
	Pollux E.	41 24 26	2982	39 53 50	2992	38 23 27	3003	36 53 17	3014
	JUPITER E.	61 36 35	2909	60 4 28	2916	58 32 29	2922	57 0 38	2928
	Regulus E.	77 0 33	2934	75 28 57	2940	73 57 29	2946	72 26 9	2953
19	MARS W.	99 36 46	3243	101 2 4	3249	102 27 15	3255	103 52 19	3261
	SATURN W.	92 26 11	2994	93 56 31	3000	95 26 43	3005	96 56 49	3011
	α Pegasi W.	92 3 8	3378	93 25 50	3385	94 48 24	3393	96 10 49	3400
	α Arietis W.	48 35 38	3238	50 1 3	3232	51 26 34	3227	52 52 11	3223
	JUPITER E.	49 23 16	2958	47 52 10	2963	46 21 11	2968	44 50 19	2973
	Regulus E.	64 51 26	2983	63 20 52	2989	61 50 25	2994	60 20 5	3000
	Spica E.	118 42 57	3019	117 13 8	3024	115 43 25	3028	114 13 47	3033
20	SATURN W.	104 25 36	3038	105 55 2	3042	107 24 23	3047	108 53 38	3052
	α Arietis W.	60 1 13	3212	61 27 8	3211	62 53 4	3211	64 19 0	3210
	Aldebaran W.	27 34 27	3034	29 3 58	3036	30 33 26	3039	32 2 50	3043
	JUPITER E.	37 17 39	3000	35 47 26	3005	34 17 20	3010	32 47 19	3015
	Regulus E.	52 50 12	3027	51 20 33	3033	49 51 1	3038	48 21 35	3043
	Spica E.	106 47 1	3054	105 17 55	3059	103 48 55	3063	102 20 0	3066
21	α Arietis W.	71 28 40	3213	72 54 34	3214	74 20 27	3214	75 46 19	3215
	Aldebaran W.	39 28 50	3059	40 57 50	3061	42 26 47	3064	43 55 41	3067
	Regulus E.	40 55 54	3066	39 27 3	3071	37 58 18	3075	36 29 38	3079
	Spica E.	94 56 33	3085	93 28 5	3088	91 59 41	3091	90 31 21	3094
22	α Arietis W.	82 55 21	3221	84 21 6	3222	85 46 49	3222	87 12 32	3223
	Aldebaran W.	51 19 24	3078	52 48 1	3078	54 16 37	3079	55 45 12	3081
	Spica E.	83 10 31	3107	81 42 30	3109	80 14 31	3110	78 46 34	3112



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Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
15	SATURN W.	49 20 17	2798	50 54 47	2806	52 29 7	2815	54 3 16	2823
	Aldebaran E.	27 57 8	2796	26 22 36	2807	24 48 17	2818	23 14 12	2828
	Pollux E.	72 16 8	2804	70 41 46	2813	69 7 35	2822	67 33 36	2831
	JUPITER E.	92 50 15	2763	91 14 59	2772	89 39 55	2781	88 5 2	2789
	Regulus E.	108 4 31	2785	106 29 44	2794	104 55 8	2802	103 20 43	2810
16	α Aquilæ W.	111 39 14	3628	112 57 18	3653	114 14 55	3680	115 32 3	3710
	MARS W.	70 42 13	3101	72 10 21	3109	73 38 19	3117	75 6 8	3124
	α Pegasi W.	64 14 54	3343	65 38 16	3338	67 1 43	3334	68 25 15	3332
	SATURN W.	61 51 28	2862	63 24 36	2869	64 57 35	2876	66 30 24	2883
	Pollux E.	59 46 30	2874	58 13 38	2883	56 40 58	2892	55 8 29	2900
	JUPITER E.	80 13 11	2827	78 39 18	2834	77 5 34	2841	75 32 0	2848
	Regulus E.	95 31 12	2849	93 57 48	2857	92 24 34	2864	90 51 29	2871
17	MARS W.	82 22 56	3162	83 49 50	3169	85 16 36	3176	86 43 14	3183
	α Pegasi W.	75 23 25	3389	76 47 3	3330	78 10 40	3334	79 34 14	3335
	SATURN W.	74 12 13	2919	75 44 8	2925	77 15 55	2932	78 47 33	2939
	Pollux E.	47 28 47	2944	45 57 24	2954	44 26 13	2963	42 55 14	2972
	JUPITER E.	67 46 26	2883	66 13 46	2890	64 41 14	2896	63 8 50	2903
	Regulus E.	83 8 23	2907	81 36 13	2913	80 4 11	2920	78 32 18	2927
18	MARS W.	93 54 17	3217	95 20 6	3224	96 45 47	3230	98 11 20	3236
	α Pegasi W.	86 31 10	3354	87 54 19	3359	89 17 22	3365	90 40 18	3371
	SATURN W.	86 23 39	2971	87 54 28	2977	89 25 10	2983	90 55 44	2989
	α Arietis W.	42 55 35	3273	44 20 18	3262	45 45 14	3253	47 10 21	3244
	Pollux E.	35 23 21	3025	33 53 39	3037	32 24 12	3050	30 55 0	3063
	JUPITER E.	55 28 54	2934	53 57 18	2940	52 25 50	2946	50 54 29	2952
	Regulus E.	70 54 57	2959	69 23 53	2965	67 52 56	2971	66 22 7	2977
19	MARS W.	105 17 17	3267	106 42 7	3272	108 6 51	3278	109 31 28	3283
	SATURN W.	98 26 48	3017	99 56 40	3022	101 26 25	3028	102 56 3	3033
	α Pegasi W.	97 33 6	3408	98 55 13	3417	100 17 11	3426	101 38 58	3435
	α Arietis W.	54 17 54	3220	55 43 40	3218	57 9 28	3215	58 35 19	3213
	JUPITER E.	43 19 33	2979	41 48 55	2985	40 18 23	2990	38 47 58	2995
	Regulus E.	58 49 53	3006	57 19 48	3011	55 49 49	3017	54 19 57	3022
	Spica E.	112 44 15	3038	111 14 49	3042	109 45 28	3046	108 16 12	3050
20	SATURN W.	110 22 47	3056	111 51 51	3060	113 20 49	3065	114 49 42	3069
	α Arietis W.	65 44 57	3211	67 10 54	3212	68 36 49	3211	70 2 45	3212
	Aldebaran W.	33 32 10	3046	35 1 26	3049	36 30 38	3052	37 59 46	3056
	JUPITER E.	31 17 25	3020	29 47 37	3025	28 17 55	3030	26 48 19	3034
	Regulus E.	46 52 15	3047	45 23 1	3052	43 53 53	3057	42 24 51	3061
	Spica E.	100 51 9	3070	99 22 23	3074	97 53 42	3078	96 25 5	3082
21	α Arietis W.	77 12 10	3216	78 38 0	3218	80 3 48	3219	81 29 35	3220
	Aldebaran W.	45 24 31	3069	46 53 18	3071	48 22 3	3073	49 50 45	3076
	Regulus E.	35 1 3	3084	33 32 34	3088	32 4 10	3092	30 35 51	3097
	Spica E.	89 3 4	3097	87 34 51	3100	86 6 42	3102	84 38 35	3105
22	α Arietis W.	88 38 14	3224	90 3 55	3225	91 29 34	3225	92 55 14	3225
	Aldebaran W.	57 13 45	3082	58 42 17	3082	60 10 49	3082	61 39 20	3082
	Spica E.	77 18 39	3113	75 50 46	3114	74 22 54	3115	72 55 3	3116

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Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
23	α Arietis W.	94 20 53	3225	95 46 32	3226	97 12 10	3226	98 37 48	3226
	Aldebaran W.	63 7 52	3082	64 36 24	3081	66 4 57	3080	67 33 31	3078
	Spica E.	71 27 13	3117	69 59 24	3117	68 31 34	3117	67 3 45	3116
	Antares E.	117 20 47	3125	115 53 8	3124	114 25 27	3122	112 57 44	3119
24	Aldebaran W.	74 56 54	3067	76 25 44	3064	77 54 38	3060	79 23 37	3056
	Pollux W.	31 8 5	3148	32 35 16	3138	34 2 39	3129	35 30 13	3120
	Spica E.	59 44 27	3112	58 16 31	3110	56 48 33	3107	55 20 32	3105
	Antares E.	105 38 22	3105	104 10 18	3101	102 42 10	3096	101 13 56	3092
	SUN E.	128 25 56	3454	127 4 40	3450	125 43 20	3446	124 21 55	3441
25	Aldebaran W.	86 49 55	3029	88 19 32	3023	89 49 16	3016	91 19 9	3009
	Pollux W.	42 50 49	3075	44 19 29	3066	45 48 20	3056	47 17 23	3047
	JUPITER W.	22 30 55	3012	24 0 53	3004	25 31 0	2996	27 1 19	2987
	Spica E.	47 59 45	3091	46 31 25	3088	45 3 1	3085	43 34 33	3082
	Antares E.	93 51 17	3064	92 22 24	3058	90 53 23	3051	89 24 13	3043
	SUN E.	117 33 25	3412	116 11 23	3405	114 49 12	3397	113 26 52	3389
26	Aldebaran W.	98 51 2	2965	100 21 58	2955	101 53 7	2945	103 24 28	2935
	Pollux W.	54 45 36	2996	56 15 53	2985	57 46 24	2973	59 17 10	2962
	JUPITER W.	34 35 38	2940	36 7 7	2930	37 38 48	2919	39 10 43	2908
	Regulus W.	18 52 46	3022	20 22 31	3006	21 52 36	2989	23 23 2	2973
	Antares E.	81 56 0	3001	80 25 49	2992	78 55 26	2982	77 24 51	2971
	SUN E.	106 32 45	3342	105 9 22	3331	103 45 46	3319	102 21 57	3307
27	Pollux W.	66 54 49	2898	68 27 11	2884	69 59 50	2869	71 32 48	2855
	JUPITER W.	46 54 2	2845	48 27 31	2832	50 1 17	2818	51 35 21	2804
	Regulus W.	31 0 14	2895	32 32 39	2880	34 5 23	2865	35 38 27	2849
	Antares E.	69 48 31	2915	68 16 31	2903	66 44 16	2890	65 11 44	2877
	SUN E.	95 19 18	3242	93 53 59	3228	92 28 23	3213	91 2 29	3198
28	Pollux W.	79 22 26	2778	80 57 23	2761	82 32 42	2744	84 8 23	2727
	JUPITER W.	59 30 31	2727	61 6 35	2711	62 43 0	2695	64 19 47	2678
	Regulus W.	43 28 56	2768	45 4 6	2751	46 39 38	2734	48 15 33	2716
	Antares E.	57 24 52	2809	55 50 36	2795	54 16 2	2781	52 41 9	2767
	SUN E.	83 48 14	3114	82 20 22	3097	80 52 9	3079	79 23 34	3060
29	Pollux W.	92 12 32	2639	93 50 34	2621	95 29 1	2602	97 7 53	2584
	JUPITER W.	72 29 34	2589	74 8 45	2571	75 48 20	2552	77 28 21	2533
	Regulus W.	56 21 7	2626	57 59 27	2607	59 38 13	2588	61 17 24	2569
	Antares E.	44 42 6	2697	43 5 22	2684	41 28 20	2672	39 51 2	2660
	SUN E.	71 54 52	2965	70 23 55	2945	68 52 33	2925	67 20 46	2905
30	Pollux W.	105 28 37	2490	107 10 4	2472	108 51 57	2453	110 34 17	2434
	JUPITER W.	85 55 1	2438	87 37 42	2419	89 20 50	2400	91 4 25	2380
	Regulus W.	69 40 0	2472	71 21 52	2453	73 4 11	2434	74 46 58	2415
	SUN E.	59 35 18	2801	58 0 52	2781	56 25 59	2760	54 50 39	2739
31	JUPITER W.	99 49 14	2286	101 35 34	2268	103 22 21	2250	105 9 35	2232
	Regulus W.	83 27 42	2320	85 13 13	2301	86 59 11	2283	88 45 35	2265
	SUN E.	46 47 7	2638	45 9 3	2618	43 30 33	2599	41 51 36	2580

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			° ' "		° ' "		° ' "		° ' "	
23	α Arietis	W.	100 3 26	3226	101 29 4	3225	102 54 43	3225	104 20 22	3225
	Aldebaran	W.	69 2 7	3077	70 30 45	3075	71 59 25	3073	73 28 8	3070
	Spica	E.	65 35 55	3116	64 8 5	3115	62 40 14	3114	61 12 21	3113
	Antares	E.	111 29 58	3117	110 2 9	3114	108 34 17	3111	107 6 21	3108
24	Aldebaran	W.	80 52 40	3052	82 21 49	3047	83 51 4	3041	85 20 26	3035
	Pollux	W.	36 57 59	3111	38 25 55	3102	39 54 2	3093	41 22 20	3084
	Spica	E.	53 52 29	3103	52 24 23	3101	50 56 14	3098	49 28 1	3095
	Antares	E.	99 45 37	3087	98 17 12	3082	96 48 41	3076	95 20 3	3070
	SUN	E.	123 0 25	3436	121 38 50	3431	120 17 8	3425	118 55 20	3419
25	Aldebaran	W.	92 49 11	3001	94 19 23	2993	95 49 45	2984	97 20 18	2975
	Pollux	W.	48 46 37	3038	50 16 3	3028	51 45 41	3018	53 15 32	3007
	JUPITER	W.	28 31 48	2978	30 2 28	2969	31 33 19	2960	33 4 22	2950
	Spica	E.	42 6 1	3079	40 37 25	3076	39 8 46	3073	37 40 4	3070
	Antares	E.	87 54 54	3036	86 25 26	3028	84 55 48	3019	83 26 0	3010
	SUN	E.	112 4 23	3380	110 41 44	3372	109 18 55	3362	107 55 56	3352
26	Aldebaran	W.	104 56 3	2924	106 27 52	2912	107 59 55	2900	109 32 14	2887
	Pollux	W.	60 48 10	2950	62 19 26	2938	63 50 57	2924	65 22 45	2911
	JUPITER	W.	40 42 52	2896	42 15 16	2884	43 47 55	2872	45 20 50	2859
	Regulus	W.	24 53 49	2957	26 24 56	2941	27 56 23	2926	29 28 9	2911
	Antares	E.	75 54 2	2961	74 23 0	2950	72 51 45	2939	71 20 15	2927
	SUN	E.	100 57 55	3295	99 33 38	3283	98 9 7	3270	96 44 20	3256
27	Pollux	W.	73 6 4	2840	74 39 39	2825	76 13 35	2810	77 47 50	2794
	JUPITER	W.	53 9 44	2789	54 44 26	2774	56 19 27	2759	57 54 49	2743
	Regulus	W.	37 11 51	2833	38 45 36	2818	40 19 41	2801	41 54 8	2785
	Antares	E.	63 38 56	2864	62 5 51	2851	60 32 29	2837	58 58 49	2823
	SUN	E.	89 36 17	3182	88 9 46	3166	86 42 56	3149	85 15 45	3132
28	Pollux	W.	85 44 26	2710	87 20 52	2693	88 57 41	2675	90 34 54	2657
	JUPITER	W.	65 56 57	2660	67 34 30	2643	69 12 27	2625	70 50 48	2607
	Regulus	W.	49 51 52	2698	51 28 34	2680	53 5 41	2662	54 43 12	2644
	Antares	E.	51 5 58	2753	49 30 28	2739	47 54 39	2725	46 18 32	2711
	SUN	E.	77 54 36	3042	76 25 16	3023	74 55 32	3004	73 25 24	2985
29	Pollux	W.	98 47 10	2565	100 26 53	2546	102 7 2	2528	103 47 36	2509
	JUPITER	W.	79 8 48	2514	80 49 41	2495	82 31 1	2476	84 12 48	2457
	Regulus	W.	62 57 2	2550	64 37 6	2530	66 17 37	2511	67 58 35	2492
	Antares	E.	38 13 27	2648	36 35 37	2638	34 57 33	2628	33 19 16	2619
	SUN	E.	65 48 33	2884	64 15 54	2864	62 42 49	2843	61 9 17	2822
30	Pollux	W.	112 17 3	2416	114 0 15	2398	115 43 53	2380	117 27 57	2361
	JUPITER	W.	92 48 28	2361	94 32 59	2343	96 17 56	2324	98 3 21	2305
	Regulus	W.	76 30 12	2396	78 13 54	2377	79 58 2	2357	81 42 38	2338
	SUN	E.	53 14 51	2719	51 38 36	2698	50 1 53	2678	48 24 43	2658
31	JUPITER	W.	106 57 15	2214	108 45 21	2197	110 33 53	2180	112 22 50	2163
	Regulus	W.	90 32 26	2248	92 19 43	2231	94 7 25	2214	95 55 32	2196
	SUN	E.	40 12 14	2561	38 32 25	2541	36 52 9	2522	35 11 26	2503

## GREENWICH MEAN TIME.

JANUARY.								FEBRUARY.							
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.			Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.		
	Noon.	Noon.	Noon.	Noon.					Noon.	Noon.	Noon.	Noon.			
	h m s	s	° ' "	"	h m				h m s	s	° ' "	"	h m		
1	17 25 0.72	+15.335	-22 50 10.4	-32.50	22 47.2	1	20 54 43.43	+17.598	-19 34 51.1	+70.94	0 12.6				
2	17 31 10.99	15.517	23 2 41.5	30.07	22 49.5	2	21 1 45.78	17.596	19 5 43.2	74.73	0 15.7				
3	17 37 25.46	15.686	23 14 12.9	27.53	22 51.8	3	21 8 48.05	17.591	18 35 4.1	78.52	0 18.8				
4	17 43 43.84	15.843	23 24 42.0	24.88	22 54.3	4	21 15 50.13	17.581	18 2 54.4	82.29	0 21.9				
5	17 50 5.86	15.990	23 34 6.5	22.15	22 56.8	5	21 22 51.89	17.565	17 29 14.3	86.04	0 25.0				
6	17 56 31.28	+16.128	-23 42 24.4	-19.33	22 59.3	6	21 29 53.19	+17.542	-16 54 4.6	+89.76	0 28.0				
7	18 2 59.90	16.256	23 49 33.8	16.44	23 1.9	7	21 36 53.85	17.512	16 17 26.2	93.43	0 31.1				
8	18 9 31.51	16.376	23 55 32.8	13.46	23 4.5	8	21 43 53.68	17.473	15 39 20.4	97.04	0 34.2				
9	18 16 5.92	16.489	24 0 19.6	10.43	23 7.2	9	21 50 52.46	17.423	14 59 48.6	100.59	0 37.2				
10	18 22 42.94	16.594	24 3 52.9	7.34	23 9.9	10	21 57 49.90	17.362	14 18 53.0	104.03	0 40.2				
11	18 29 22.39	+16.692	-24 6 11.2	-4.17	23 12.7	11	22 4 45.71	+17.286	-13 36 36.1	+107.35	0 43.2				
12	18 36 4.12	16.784	24 7 12.9	-0.96	23 15.5	12	22 11 39.50	17.193	12 53 1.1	110.53	0 46.2				
13	18 42 47.97	16.870	24 6 56.9	+2.32	23 18.3	13	22 18 30.83	17.081	12 8 12.0	113.53	0 49.1				
14	18 49 33.81	16.949	24 5 22.0	5.62	23 21.1	14	22 25 19.19	16.945	11 22 13.4	116.31	0 52.0				
15	18 56 21.48	17.023	24 2 26.9	8.99	23 24.0	15	22 32 3.97	16.781	10 35 10.9	118.84	0 54.8				
16	19 3 10.86	+17.091	-23 58 10.8	+12.39	23 26.9	16	22 38 44.45	+16.586	-9 47 11.4	+121.07	0 57.5				
17	19 10 1.82	17.155	23 52 32.5	15.83	23 29.9	17	22 45 19.82	16.354	8 58 22.5	122.94	1 0.2				
18	19 16 54.24	17.213	23 45 31.2	19.31	23 32.8	18	22 51 49.13	16.080	8 8 53.6	124.40	1 2.7				
19	19 23 48.00	17.267	23 37 5.9	22.82	23 35.8	19	22 58 11.28	15.758	7 18 55.2	125.38	1 5.2				
20	19 30 42.99	17.315	23 27 15.7	26.38	23 38.8	20	23 4 25.06	15.381	6 28 39.5	125.83	1 7.4				
21	19 37 39.10	+17.360	-23 15 59.9	+29.96	23 41.8	21	23 10 29.09	+14.944	-5 38 20.2	+125.67	1 9.6				
22	19 44 36.24	17.401	23 3 17.7	33.58	23 44.8	22	23 16 21.85	14.440	4 48 12.6	124.85	1 11.5				
23	19 51 34.31	17.437	22 49 8.3	37.22	23 47.9	23	23 22 1.68	13.866	3 58 33.4	123.29	1 13.2				
24	19 58 33.20	17.470	22 33 31.2	40.89	23 50.9	24	23 27 26.80	13.215	3 9 41.1	120.94	1 14.7				
25	20 5 32.81	17.499	22 16 25.7	44.59	23 54.0	25	23 32 35.32	12.482	2 21 54.8	117.76	1 15.8				
26	20 12 33.08	+17.524	-21 57 51.1	+48.31	23 57.1	26	23 37 25.27	+11.667	-1 35 35.3	+113.71	1 16.7				
27	20 19 33.91	17.545	21 37 47.1	52.05	.	27	23 41 54.68	10.770	0 51 3.8	108.76	1 17.2				
28	20 26 35.21	17.563	21 16 13.2	55.81	0 0.2	28	23 46 1.57	9.790	0 8 42.0	102.91	1 17.4				
29	20 33 36.90	17.577	20 53 8.9	59.57	0 3.3	29	23 49 43.99	8.732	+0 31 8.6	96.16	1 17.2				
30	20 40 38.90	17.588	20 28 34.0	63.35	0 6.4	30	23 53 0.13	7.601	1 8 6.5	88.53	1 16.5				
31	20 47 41.10	+17.595	-20 2 28.1	+67.14	0 9.5	31	23 55 48.33	+6.406	+1 41 51.3	+80.06	1 15.3				
32	20 54 43.43	+17.598	-19 34 51.1	+70.94	0 12.6	32	23 58 7.19	+5.157	+2 12 3.3	+70.82	1 13.6				
Day of the Month.								Day of the Month.							
0 5th. 10th. 15th. 20th. 25th. 30th.								4th. 9th. 14th. 19th. 24th.							
Semidiameter 2.68 2.55 2.47 2.40 2.37 2.35 2.36								Semidiameter. . . . 2.40 2.47 2.59 2.79 3.09							
Hor. Parallax 7.07 6.73 6.50 6.34 6.24 6.20 6.23								Hor. Parallax. . . . 6.32 6.51 6.83 7.35 8.15							

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	23 49 43.99	+ 8.732	+ 0 31 8.6	+ 96.16	1 17.2	1	23 18 6.88	+ 1.455	- 4 17 12.7	- 30.26	22 40.3
2	23 53 0.13	7.601	1 8 6.5	88.53	1 16.5	2	23 18 51.51	2.258	4 28 2.4	23.89	22 37.4
3	23 55 48.33	6.406	1 41 51.3	80.06	1 15.3	3	23 19 55.01	3.027	4 36 19.8	17.58	22 34.8
4	23 58 7.19	5.157	2 12 3.3	70.82	1 13.6	4	23 21 16.53	3.760	4 42 7.2	11.39	22 32.5
5	23 59 55.52	3.865	2 38 24.5	60.85	1 11.5	5	23 22 55.20	4.456	4 45 27.6	- 5.33	22 30.5
6	0 1 12.52	+ 2.548	+ 3 0 38.7	+ 50.24	1 8.8	6	23 24 50.14	+ 5.115	- 4 46 24.5	+ 0.56	22 28.7
7	0 1 57.74	+ 1.221	3 18 31.7	39.11	1 5.6	7	23 27 0.46	5.739	4 45 2.2	6.27	22 27.1
8	0 2 11.20	- 0.096	3 31 52.6	27.56	1 1.9	8	23 29 25.32	6.327	4 41 24.7	11.82	22 25.8
9	0 1 53.39	1.381	3 40 32.4	15.73	0 57.6	9	23 32 3.87	6.881	4 35 36.4	17.18	22 24.7
10	0 1 5.34	2.612	3 44 27.1	+ 3.81	0 52.9	10	23 34 55.34	7.403	4 27 41.7	22.35	22 23.8
11	23 59 48.62	- 3.766	+ 3 43 36.2	- 8.03	0 47.6	11	23 37 58.98	+ 7.896	- 4 17 44.9	+ 27.35	22 23.1
12	23 58 5.37	4.819	3 38 3.8	19.60	0 42.0	12	23 41 14.12	8.361	4 5 50.3	32.17	22 22.6
13	23 55 58.28	5.749	3 27 59.2	30.68	0 36.0	13	23 44 40.09	8.799	3 52 2.2	36.81	22 22.3
14	23 53 30.54	6.536	3 13 36.9	41.04	0 29.6	14	23 48 16.32	9.215	3 36 24.5	41.30	22 22.1
15	23 50 45.80	7.164	2 55 16.8	50.45	0 22.9	15	23 52 2.26	9.610	3 19 1.0	45.63	22 22.0
16	23 47 48.04	- 7.619	+ 2 33 23.7	- 58.75	0 16.0	16	23 55 57.43	+ 9.985	- 2 59 55.7	+ 49.80	22 22.1
17	23 44 41.49	7.896	2 8 27.1	65.74	0 9.0	17	0 0 1.38	10.342	2 39 11.8	53.82	22 22.4
18	23 41 30.46	7.994	1 40 59.5	71.31	0 0 1.9	18	0 4 13.73	10.685	2 16 53.2	57.71	22 22.8
19	23 38 19.21	7.915	1 11 36.2	75.37	23 47.8	19	0 8 34.14	11.014	1 53 2.7	61.47	22 23.3
20	23 35 11.83	7.673	0 40 53.6	77.97	23 40.8	20	0 13 2.31	11.331	1 27 43.7	65.09	22 23.9
21	23 32 12.10	- 7.281	+ 0 9 27.8	- 78.98	23 34.1	21	0 17 37.95	+ 11.637	- 1 0 59.3	+ 68.59	22 24.7
22	23 29 23.39	6.758	- 0 22 6.4	78.64	23 27.6	22	0 22 20.85	11.937	0 32 52.3	71.97	22 25.6
23	23 26 48.61	6.123	0 53 16.9	77.02	23 21.4	23	0 27 10.86	12.230	- 0 3 25.6	75.24	22 26.6
24	23 24 30.20	5.398	1 23 34.5	74.27	23 15.5	24	0 32 7.83	12.516	+ 0 27 18.1	78.39	22 27.7
25	23 22 30.04	4.605	1 52 34.1	70.57	23 9.9	25	0 37 11.65	12.801	0 59 16.2	81.43	22 28.9
26	23 20 49.53	- 3.764	- 2 19 54.5	- 66.02	23 4.6	26	0 42 22.25	+ 13.083	+ 1 32 25.9	+ 84.36	22 30.3
27	23 19 29.63	2.891	2 45 18.2	60.86	22 59.7	27	0 47 39.62	13.365	2 6 44.7	87.19	22 31.7
28	23 18 30.88	2.004	3 8 32.1	55.22	22 55.1	28	0 53 3.74	13.646	2 42 10.1	89.91	22 33.3
29	23 17 53.45	1.116	3 29 26.1	49.23	22 50.9	29	0 58 34.62	13.929	3 18 39.4	92.52	22 35.0
30	23 17 37.25	- 0.237	3 47 53.3	43.01	22 47.0	30	1 4 12.35	14.216	3 56 10.2	95.02	22 36.8
31	23 17 41.90	+ 0.621	- 4 3 49.7	- 36.66	22 43.5	31	1 9 57.03	+ 14.507	+ 4 34 39.6	+ 97.41	22 38.7
32	23 18 6.88	+ 1.455	- 4 17 12.7	- 30.26	22 40.3	32	1 15 48.76	+ 14.804	+ 5 14 5.2	+ 99.69	22 40.7
Day of the Month.						Day of the Month.					
1st. 6th. 11th. 16th. 21st. 26th. 31st.						5th. 10th. 15th. 20th. 25th. 30th.					
Semidiameter . 3.54 4.14 4.80 5.33 5.53 5.38 5.02						Semidiameter . . 4.61 4.21 3.85 3.55 3.29 3.06					
Hor. Parallax . 9.34 10.91 12.65 14.04 14.57 14.17 13.23						Hor. Parallax . . 12.14 11.08 10.15 9.35 8.66 8.06					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	1 9 57.03	+14.507	+4 34 39.6	+97.41	22 38.7	1	5 14 17.05	+22.765	+24 38 22.8	+40.80	0 39.1
2	1 15 48.76	14.804	5 14 5.2	99.69	22 40.7	2	5 23 20.60	22.523	24 53 19.7	33.95	0 44.3
3	1 21 47.67	15.107	5 54 23.8	101.84	22 42.9	3	5 32 17.76	22.233	25 5 33.1	27.18	0 49.3
4	1 27 53.92	15.416	6 35 32.5	103.86	22 45.2	4	5 41 7.45	21.901	25 15 5.6	20.55	0 54.2
5	1 34 7.72	15.735	7 17 28.2	105.75	22 47.6	5	5 49 48.72	21.532	25 22 0.8	14.09	0 59.0
6	1 40 29.29	+16.063	+8 0 7.5	+107.49	22 50.1	6	5 58 20.71	+21.129	+25 26 23.7	+7.85	1 3.5
7	1 46 58.84	16.401	8 43 26.6	109.08	22 52.8	7	6 6 42.67	20.697	25 28 19.6	+1.85	1 8.0
8	1 53 36.63	16.749	9 27 22.0	110.50	22 55.6	8	6 14 53.96	20.239	25 27 54.7	-3.88	1 12.2
9	2 0 22.89	17.108	10 11 49.0	111.72	22 58.6	9	6 22 54.04	19.763	25 25 15.5	9.34	1 16.3
10	2 7 17.88	17.477	10 56 42.9	112.73	23 1.7	10	6 30 42.44	19.268	25 20 28.9	14.50	1 20.1
11	2 14 21.86	+17.856	+11 41 58.5	+113.52	23 5.0	11	6 38 18.77	+18.758	+25 13 42.1	-19.35	1 23.8
12	2 21 35.07	18.246	12 27 30.0	114.06	23 8.5	12	6 45 42.70	18.235	25 5 2.3	23.91	1 27.3
13	2 28 57.74	18.644	13 13 11.2	114.32	23 12.1	13	6 52 53.95	17.702	24 54 36.7	28.17	1 30.5
14	2 36 30.06	19.051	13 58 54.9	114.27	23 15.8	14	6 59 52.32	17.160	24 42 32.5	32.13	1 33.5
15	2 44 12.19	19.461	14 44 33.4	113.91	23 19.8	15	7 6 37.57	16.610	24 28 57.0	35.78	1 36.3
16	2 52 4.19	+19.873	+15 29 58.1	+113.12	23 23.9	16	7 13 9.55	+16.054	+24 13 57.5	-39.14	1 38.9
17	3 0 6.09	20.285	16 14 59.8	111.96	23 28.1	17	7 19 28.09	15.491	23 57 40.6	42.22	1 41.3
18	3 8 17.81	20.690	16 59 28.5	110.36	23 32.5	18	7 25 33.05	14.921	23 40 13.3	45.01	1 43.4
19	3 16 39.16	21.086	17 43 13.3	108.29	23 37.1	19	7 31 24.30	14.348	23 21 42.5	47.52	1 45.3
20	3 25 9.81	21.466	18 26 2.7	105.74	23 41.8	20	7 37 1.70	13.768	23 2 14.7	49.75	1 47.0
21	3 33 49.33	+21.823	+19 7 44.8	+102.68	23 46.7	21	7 42 25.10	+13.181	+22 41 56.5	-51.72	1 48.4
22	3 42 37.08	22.151	19 48 7.3	99.10	23 51.7	22	7 47 34.36	12.589	22 20 54.2	53.42	1 49.6
23	3 51 32.30	22.445	20 26 57.7	95.01	23 56.8	23	7 52 29.32	11.990	21 59 14.3	54.84	1 50.5
24	4 0 34.09	22.697	21 4 3.7	90.41	.	24	7 57 9.81	11.383	21 37 3.1	56.03	1 51.2
25	4 9 41.38	22.902	21 39 13.6	85.33	0 2.0	25	8 1 35.64	10.768	21 14 26.8	56.95	1 51.7
26	4 18 52.97	+23.055	+22 12 16.2	+79.82	0 7.3	26	8 5 46.60	+10.144	+20 51 31.6	-57.61	1 51.9
27	4 28 7.58	23.152	22 43 1.7	73.91	0 12.6	27	8 9 42.47	9.510	20 28 23.7	58.01	1 51.9
28	4 37 23.82	23.191	23 11 21.2	67.67	0 18.0	28	8 13 23.00	8.865	20 5 9.3	58.15	1 51.7
29	4 46 40.30	23.171	23 37 7.6	61.17	0 23.3	29	8 16 47.92	8.208	19 41 54.5	58.04	1 51.1
30	4 55 55.59	23.092	24 0 15.7	54.47	0 28.6	30	8 19 56.96	7.541	19 18 45.6	57.66	1 50.3
31	5 5 8.28	+22.956	+24 20 41.4	+47.66	0 33.8	31	8 22 49.78	+6.839	+18 55 49.0	-57.01	1 49.2
32	5 14 17.05	+22.765	+24 38 22.8	+40.80	0 39.1	32	8 25 26.08	+6.164	+18 33 11.0	-56.09	1 47.8
Day of the Month.						Day of the Month.					
5th. 10th. 15th. 20th. 25th. 30th.						4th. 9th. 14th. 19th. 24th. 29th.					
Semidiameter . . . 2.87 2.71 2.60 2.54 2.53 2.59						Semidiameter . . . 2.73 2.92 3.17 3.46 3.81 4.20					
Hor. Parallax . . . 7.56 7.16 6.86 6.68 6.67 6.84						Hor. Parallax . . . 7.18 7.70 8.35 9.13 10.04 11.06					

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	8 22 49.78	+ 6.859	+18 55 49.0	- 57.01	1 49.2	1	7 52 25.92	- 2.803	+16 40 20.4	+ 37.54	23 11.9
2	8 25 26.08	6.164	18 33 11.0	56.09	1 47.8	2	7 51 30.33	1.819	16 55 23.1	37.61	23 7.5
3	8 27 45.53	5.454	18 10 58.0	54.92	1 46.2	3	7 50 59.12	- 0.773	17 10 21.7	37.20	23 3.4
4	8 29 47.77	4.730	17 49 16.7	53.47	1 44.3	4	7 50 53.61	+ 0.322	17 25 4.9	36.32	22 59.8
5	8 31 32.45	3.992	17 28 13.6	51.75	1 42.1	5	7 51 14.90	1.457	17 39 21.2	34.96	22 56.7
6	8 32 59.24	+ 3.240	+17 7 55.1	- 49.74	1 39.5	6	7 52 3.76	+ 2.619	+17 52 59.3	+ 33.14	22 54.0
7	8 34 7.84	2.475	16 48 28.3	47.41	1 36.7	7	7 53 20.73	3.798	18 5 48.0	30.84	22 51.8
8	8 34 57.97	1.700	16 29 59.9	44.87	1 33.6	8	7 55 6.13	4.986	18 17 36.0	28.08	22 50.1
9	8 35 29.38	0.916	16 12 36.5	42.03	1 30.1	9	7 57 20.03	6.172	18 28 12.2	24.86	22 48.8
10	8 35 41.92	+ 0.128	15 56 24.8	38.90	1 26.4	10	8 0 2.32	7.348	18 37 25.5	21.17	22 48.0
11	8 35 35.52	- 0.661	+15 41 31.3	- 35.51	1 22.4	11	8 3 12.68	+ 8.510	+18 45 4.7	+ 17.02	22 47.7
12	8 35 10.23	1.446	15 28 2.3	31.86	1 18.0	12	8 6 50.60	9.645	18 50 59.1	12.43	22 47.8
13	8 34 26.23	2.219	15 16 3.7	27.98	1 13.3	13	8 10 55.39	10.747	18 54 58.0	7.40	22 48.4
14	8 33 23.90	2.972	15 5 41.1	23.88	1 8.3	14	8 15 26.16	11.810	18 56 51.1	+ 1.96	22 49.3
15	8 32 3.80	3.698	14 56 59.3	19.58	1 3.1	15	8 20 21.86	12.823	18 56 28.8	- 3.87	22 50.7
16	8 30 26.69	- 4.387	+14 50 2.5	- 15.13	0 57.5	16	8 25 41.22	+ 13.780	+18 53 42.3	- 10.06	22 52.4
17	8 28 33.62	5.027	14 44 54.3	10.55	0 51.7	17	8 31 22.81	14.675	18 48 23.7	16.54	22 54.5
18	8 26 25.88	5.607	14 41 36.8	5.91	0 45.6	18	8 37 25.02	15.498	18 40 26.3	23.28	22 56.9
19	8 24 5.06	6.115	14 40 11.0	- 1.24	0 39.4	19	8 43 46.09	16.245	18 29 45.0	30.19	22 59.6
20	8 21 33.04	6.539	14 40 37.0	+ 3.39	0 32.9	20	8 50 24.13	16.910	18 16 16.4	37.21	23 2.5
21	8 18 51.96	- 6.868	+14 42 53.2	+ 7.94	0 26.3	21	8 57 17.10	+ 17.490	+17 59 58.9	- 44.25	23 5.7
22	8 16 4.23	7.091	14 46 56.7	12.38	0 19.6	22	9 4 22.95	17.983	17 40 52.8	51.24	23 9.0
23	8 13 12.50	7.201	14 52 43.1	16.50	0 12.9	23	9 11 39.56	18.387	17 19 0.5	58.09	23 12.5
24	8 10 19.56	7.190	15 0 6.7	20.41	0 6.1	24	9 19 4.84	18.705	16 54 26.2	64.72	23 16.1
25	8 7 28.39	7.053	15 9 0.5	24.02	23 52.6	25	9 26 36.74	18.941	16 27 16.0	71.07	23 19.8
26	8 4 42.02	- 6.790	+15 19 16.5	+ 27.26	23 46.1	26	9 34 13.33	+ 19.097	+15 57 37.4	- 77.08	23 23.5
27	8 2 3.45	6.403	15 30 45.6	30.11	23 39.7	27	9 41 52.81	19.181	15 25 39.4	82.69	23 27.2
28	7 59 35.66	5.894	15 43 17.7	32.51	23 33.5	28	9 49 33.54	19.201	14 51 31.7	87.87	23 31.0
29	7 57 21.47	5.270	15 56 42.3	34.47	23 27.6	29	9 57 14.06	19.165	14 15 24.9	92.62	23 34.7
30	7 55 23.53	4.541	16 10 48.5	35.97	23 22.0	30	10 4 53.10	19.080	13 37 29.7	96.90	23 38.4
31	7 53 44.28	- 3.714	+16 25 25.0	+ 36.99	23 16.8	31	10 12 29.59	+ 18.954	+12 57 57.2	- 100.73	23 42.0
32	7 52 25.92	- 2.803	+16 40 20.4	+ 37.54	23 11.9	32	10 20 2.64	+ 18.795	+12 16 58.1	- 104.12	23 45.6
Day of the Month.						Day of the Month.					
4th. 9th. 14th. 19th. 24th. 29th.						3d. 8th. 13th. 18th. 23d. 28th.					
Semidiameter . 4.63 5.07 5.46 5.72 5.71 5.40						Semidiameter . 4.87 4.25 3.68 3.21 2.87 2.64					
Hor. Parallax . 12.20 13.35 14.40 15.06 15.04 14.23						Hor. Parallax . 12.82 11.21 9.70 8.46 7.55 6.95					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

GREENWICH MEAN TIME.											
SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	10 20 2.64	+18.795	+12 16 58.1	-104.12	23 45.6	1	13 29 53.55	+13.704	-10 13 25.7	-99.60	0 53.7
2	10 27 31.53	18.609	11 34 42.9	107.08	23 49.0	2	13 35 21.47	13.623	10 52 56.0	97.92	0 55.2
3	10 34 55.69	18.402	10 51 21.6	109.63	23 52.4	3	13 40 47.46	13.543	11 31 45.5	96.19	0 56.7
4	10 42 14.72	18.181	10 7 3.7	111.80	23 55.7	4	13 46 11.54	13.464	12 9 52.7	94.40	0 58.2
5	10 49 28.32	17.950	9 21 58.0	113.62	23 58.9	5	13 51 33.72	13.385	12 47 16.3	92.55	0 59.6
6	10 56 36.30	+17.714	+ 8 36 12.6	-115.11	. .	6	13 56 53.99	+13.304	-13 23 54.7	-90.64	1 1.0
7	11 3 38.58	17.475	7 49 55.0	116.31	0 2.0	7	14 2 12.29	13.221	13 59 46.5	88.66	1 2.3
8	11 10 35.12	17.237	7 3 12.1	117.22	0 5.0	8	14 7 28.57	13.135	14 34 50.1	86.62	1 3.7
9	11 17 25.97	17.001	6 16 10.3	117.89	0 7.9	9	14 12 42.74	13.044	15 9 3.8	84.51	1 5.0
10	11 24 11.23	16.771	5 28 55.2	118.33	0 10.7	10	14 17 54.64	12.947	15 42 25.9	82.32	1 6.2
11	11 30 51.02	+16.546	+ 4 41 31.9	-118.57	0 13.5	11	14 23 4.12	+12.842	-16 14 54.7	-80.06	1 7.4
12	11 37 25.50	16.329	3 54 5.1	118.63	0 16.1	12	14 28 10.98	12.728	16 46 28.2	77.70	1 8.6
13	11 43 54.85	16.120	3 6 39.1	118.51	0 18.6	13	14 33 14.96	12.602	17 17 4.3	75.28	1 9.7
14	11 50 19.26	15.918	2 19 17.6	118.25	0 21.1	14	14 38 15.77	12.463	17 46 40.9	72.76	1 10.8
15	11 56 38.94	15.725	1 32 4.1	117.85	0 23.5	15	14 43 13.07	12.309	18 15 15.8	70.13	1 11.8
16	12 2 54.11	+15.541	+ 0 45 1.7	-117.33	0 25.8	16	14 48 6.44	+12.136	-18 42 46.5	-67.40	1 12.7
17	12 9 4.97	15.365	- 0 1 46.7	116.69	0 28.0	17	14 52 55.41	11.941	19 9 10.3	64.56	1 13.6
18	12 15 11.74	15.200	0 48 18.5	115.95	0 30.2	18	14 57 39.43	11.722	19 34 24.5	61.60	1 14.4
19	12 21 14.63	15.042	1 34 31.4	115.11	0 32.3	19	15 2 17.87	11.476	19 58 25.9	58.50	1 15.1
20	12 27 13.84	14.892	2 20 23.2	114.19	0 34.4	20	15 6 50.02	11.196	20 21 11.3	55.25	1 15.7
21	12 33 9.58	+14.753	- 3 5 51.9	-113.19	0 36.4	21	15 11 15.01	+10.880	-20 42 37.0	-51.86	1 16.1
22	12 39 2.04	14.620	3 50 55.6	112.11	0 38.3	22	15 15 31.95	10.523	21 2 39.1	48.29	1 16.5
23	12 44 51.41	14.495	4 35 32.6	110.96	0 40.2	23	15 19 39.75	10.119	21 21 13.3	44.53	1 16.7
24	12 50 37.87	14.377	5 19 41.2	109.75	0 42.0	24	15 23 37.21	9.660	21 38 15.0	40.57	1 16.7
25	12 56 21.57	14.265	6 3 20.0	108.48	0 43.8	25	15 27 22.95	9.141	21 53 38.7	36.38	1 16.5
26	13 2 2.67	+14.160	- 6 46 27.5	-107.14	0 45.5	26	15 30 55.46	+ 8.556	-22 7 18.7	-31.92	1 16.1
27	13 7 41.31	14.060	7 29 2.2	105.74	0 47.2	27	15 34 13.05	7.896	22 19 8.6	27.19	1 15.4
28	13 13 17.61	13.965	8 11 2.7	104.29	0 48.9	28	15 37 13.82	7.153	22 29 1.2	22.14	1 14.5
29	13 18 51.68	13.875	8 52 27.7	102.78	0 50.5	29	15 39 55.66	6.319	22 36 48.4	16.74	1 13.2
30	13 24 23.64	13.789	9 33 15.8	101.22	0 52.1	30	15 42 16.34	5.387	22 42 21.2	10.93	1 11.6
31	13 29 53.55	+13.704	-10 13 25.7	- 99.60	0 53.7	31	15 44 13.40	+ 4.350	-22 45 29.8	- 4.70	1 9.6
32	13 35 21.47	+13.623	-10 52 56.0	- 97.92	0 55.2	32	15 45 44.28	+ 3.204	-22 46 3.1	+ 2.01	1 7.1
Day of the Month.						Day of the Month.					
2d. 7th. 12th. 17th. 22d. 27th.						2d. 7th. 12th. 17th. 22d. 27th.					
Semidiameter . . 2.50 2.43 2.40 2.41 2.44 2.49						Semidiameter . . 2.57 2.67 2.81 3.02 3.30 3.57					
Hor. Parallax . . 6.59 6.40 6.33 6.34 6.42 6.56						Hor. Parallax . . 6.77 7.05 7.41 7.90 8.54 9.40					
NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.											

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.



## GREENWICH MEAN TIME.

GREENWICH MEAN TIME.																								
NOVEMBER.						DECEMBER.																		
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.							
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.								
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m							
1	15 45 44.28	+ 3.204	-22 46 3.1	+ 2.01	1 7.1	1	15 4 41.73	+ 9.746	-14 54 19.4	-51.16	22 28.0	2	15 8 44.57	10.475	15 15 33.9	54.91	22 28.4							
2	15 46 46.31	1.946	22 43 49.3	9.24	1 4.2	2	15 8 44.57	10.475	15 15 33.9	54.91	22 28.4	3	15 13 3.90	11.122	15 38 8.7	57.87	22 29.0							
3	15 47 16.81	+ 0.578	22 38 35.4	17.01	1 0.7	3	15 13 3.90	11.122	15 38 8.7	57.87	22 29.0	4	15 17 37.85	11.696	16 1 46.0	60.12	22 29.8							
4	15 47 13.23	- 0.893	22 30 8.2	25.35	0 56.7	4	15 17 37.85	11.696	16 1 46.0	60.12	22 29.8	5	15 22 24.77	12.204	16 26 9.7	61.75	22 30.8							
5	15 46 33.29	2.449	22 18 14.2	34.24	0 52.1	5	15 22 24.77	12.204	16 26 9.7	61.75	22 30.8	6	15 27 23.21	+ 12.657	-16 51 5.6	-62.82	22 32.0							
6	15 45 15.19	- 4.067	-22 2 40.8	+ 43.62	0 46.9	6	15 27 23.21	+ 12.657	-16 51 5.6	-62.82	22 32.0	7	15 32 31.92	13.061	17 16 21.2	63.41	22 33.4							
7	15 43 17.89	5.709	21 43 17.6	53.36	0 41.0	7	15 32 31.92	13.061	17 16 21.2	63.41	22 33.4	8	15 37 49.81	13.423	17 41 45.7	63.56	22 34.9							
8	15 40 41.39	7.325	21 19 58.2	63.26	0 34.4	8	15 37 49.81	13.423	17 41 45.7	63.56	22 34.9	9	15 43 15.94	13.749	18 7 9.2	63.34	22 36.5							
9	15 37 27.01	8.854	20 52 42.3	73.01	0 27.3	9	15 43 15.94	13.749	18 7 9.2	63.34	22 36.5	10	15 48 49.50	14.043	18 32 23.2	62.78	22 38.2							
10	15 33 37.70	10.223	20 21 38.3	82.20	0 19.6	10	15 48 49.50	14.043	18 32 23.2	62.78	22 38.2	11	15 54 29.78	+ 14.310	-18 57 20.3	-61.93	22 40.0							
11	15 29 18.20	-11.356	-19 47 5.5	+ 90.31	0 11.3	11	15 54 29.78	+ 14.310	-18 57 20.3	-61.93	22 40.0	12	16 0 16.18	14.554	19 21 53.9	60.82	22 41.9							
12	15 24 35.05	12.181	19 9 36.4	96.79	0 2.7	12	16 0 16.18	14.554	19 21 53.9	60.82	22 41.9	13	16 6 8.19	14.777	19 45 57.9	59.48	22 43.9							
13	15 19 36.43	12.636	18 29 57.2	101.06	23 44.9	13	16 6 8.19	14.777	19 45 57.9	59.48	22 43.9	14	16 12 5.34	14.983	20 9 27.3	57.94	22 46.0							
14	15 14 31.77	12.681	17 49 6.5	102.68	23 36.0	14	16 12 5.34	14.983	20 9 27.3	57.94	22 46.0	15	16 18 7.24	15.174	20 32 17.5	56.22	22 48.2							
15	15 9 31.09	12.305	17 8 12.0	101.34	23 27.3	15	16 18 7.24	15.174	20 32 17.5	56.22	22 48.2	16	16 24 13.57	+ 15.351	-20 54 24.4	-54.33	22 50.4							
16	15 4 44.34	-11.525	-16 28 26.3	+ 96.96	23 19.0	16	16 24 13.57	+ 15.351	-20 54 24.4	-54.33	22 50.4	17	16 30 24.02	15.518	21 15 44.1	52.29	22 52.7							
17	15 0 20.74	10.387	15 51 0.4	89.74	23 11.2	17	16 30 24.02	15.518	21 15 44.1	52.29	22 52.7	18	16 36 38.33	15.674	21 36 13.4	50.12	22 55.1							
18	14 56 28.07	8.960	15 16 57.8	80.10	23 4.0	18	16 36 38.33	15.674	21 36 13.4	50.12	22 55.1	19	16 42 56.28	15.821	21 55 49.1	47.84	22 57.5							
19	14 53 12.36	7.321	14 47 10.6	68.57	22 57.5	19	16 42 56.28	15.821	21 55 49.1	47.84	22 57.5	20	16 49 17.68	15.961	22 14 28.6	45.44	23 0.0							
20	14 50 37.72	5.551	14 22 16.1	55.82	22 51.7	20	16 49 17.68	15.961	22 14 28.6	45.44	23 0.0	21	16 55 42.33	+ 16.093	-22 32 9.2	-42.94	23 2.5							
21	14 48 46.39	- 3.725	-14 2 36.3	+ 42.46	22 46.6	21	16 55 42.33	+ 16.093	-22 32 9.2	-42.94	23 2.5	22	17 2 10.08	16.219	22 48 48.7	40.34	23 5.1							
22	14 47 38.88	1.907	13 48 18.7	29.05	22 42.2	22	17 2 10.08	16.219	22 48 48.7	40.34	23 5.1	23	17 8 40.78	16.339	23 4 24.8	37.66	23 7.7							
23	14 47 14.40	- 0.146	13 39 18.6	16.07	22 38.5	23	17 8 40.78	16.339	23 4 24.8	37.66	23 7.7	24	17 15 14.26	16.452	23 18 55.5	34.88	23 10.4							
24	14 47 31.13	+ 1.522	13 35 21.6	+ 3.84	22 35.5	24	17 15 14.26	16.452	23 18 55.5	34.88	23 10.4	25	17 21 50.45	16.562	23 32 18.9	32.05	23 13.1							
25	14 48 26.53	3.074	13 36 6.6	- 7.40	22 33.0	25	17 21 50.45	16.562	23 32 18.9	32.05	23 13.1	26	17 28 29.21	+ 16.667	-23 44 33.3	-29.14	23 15.8							
26	14 49 57.66	+ 4.498	-13 41 8.1	- 17.52	22 31.1	26	17 28 29.21	+ 16.667	-23 44 33.3	-29.14	23 15.8	27	17 35 10.43	16.767	23 55 36.9	26.15	23 18.6							
27	14 52 1.40	5.791	13 49 58.5	26.47	22 29.7	27	17 35 10.43	16.767	23 55 36.9	26.15	23 18.6	28	17 41 54.00	16.862	24 5 28.1	23.10	23 21.4							
28	14 54 34.60	6.955	14 2 9.6	34.26	22 28.7	28	17 41 54.00	16.862	24 5 28.1	23.10	23 21.4	29	17 48 39.80	16.954	24 14 5.3	20.00	23 24.3							
29	14 57 34.25	7.996	14 17 14.0	40.92	22 28.1	29	17 48 39.80	16.954	24 14 5.3	20.00	23 24.3	30	17 55 27.75	17.041	24 21 27.4	16.82	23 27.2							
30	15 0 57.50	8.923	14 34 45.3	46.52	22 27.9	30	17 55 27.75	17.041	24 21 27.4	16.82	23 27.2	31	18 2 17.73	+ 17.124	-24 27 32.6	-13.60	23 30.1							
31	15 4 41.73	+ 9.746	-14 54 19.4	- 51.16	22 28.0	31	18 2 17.73	+ 17.124	-24 27 32.6	-13.60	23 30.1	32	18 9 9.65	+ 17.202	-24 32 19.7	-10.31	23 33.1							
32	15 8 44.57	+ 10.475	-15 15 33.9	- 54.91	22 28.4	32	18 9 9.65	+ 17.202	-24 32 19.7	-10.31	23 33.1													
Day of the Month.						1st.	6th.	11th.	16th.	21st.	26th.	Day of the Month.						1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .						3.99	4.49	4.89	4.86	4.38	3.79	Semidiameter . .						3.32	2.99	2.76	2.59	2.48	2.40	2.33
Hor. Parallax . .						10.52	11.83	12.87	12.80	11.53	9.99	Hor. Parallax . .						8.75	7.87	7.26	6.83	6.53	6.33	6.21
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.																								

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	16 3 26.80	+ 4.401	-16 20 44.4	- 3.77	21 21.6	1	17 38 41.03	+ 10.019	-19 22 52.8	-13.75	20 56.7
2	16 5 15.88	4.688	16 22 34.4	5.36	21 19.6	2	17 42 42.73	10.122	19 28 15.0	13.06	20 56.8
3	16 7 11.73	4.965	16 25 1.0	6.84	21 17.8	3	17 46 46.88	10.223	19 33 20.2	12.33	20 56.9
4	16 9 14.12	5.233	16 28 1.8	8.21	21 16.0	4	17 50 53.39	10.319	19 38 7.3	11.57	20 57.1
5	16 11 22.84	5.493	16 31 34.3	9.49	21 14.2	5	17 55 2.16	10.411	19 42 35.5	10.76	20 57.3
6	16 13 37.70	+ 5.744	-16 35 36.2	-10.67	21 12.5	6	17 59 13.11	+ 10.500	-19 46 43.8	- 9.91	20 57.6
7	16 15 58.48	5.986	16 40 5.4	11.76	21 11.0	7	18 3 26.16	10.586	19 50 31.3	9.02	20 57.9
8	16 18 24.97	6.220	16 44 59.6	12.75	21 9.6	8	18 7 41.21	10.667	19 53 56.8	8.09	20 58.2
9	16 20 57.00	6.447	16 50 16.4	13.65	21 8.3	9	18 11 58.16	10.745	19 56 59.8	7.14	20 58.6
10	16 23 34.36	6.665	16 55 53.6	14.45	21 7.1	10	18 16 16.94	10.819	19 59 39.5	6.16	20 59.0
11	16 26 16.86	+ 6.875	-17 1 49.2	-15.17	21 5.9	11	18 20 37.46	+ 10.890	-20 1 55.2	- 5.15	20 59.4
12	16 29 4.32	7.079	17 8 1.0	15.80	21 4.8	12	18 24 59.64	10.957	20 3 46.0	4.11	20 59.8
13	16 31 56.58	7.275	17 14 26.9	16.35	21 3.8	13	18 29 23.39	11.021	20 5 11.4	3.03	21 0.3
14	16 34 53.47	7.465	17 21 5.1	16.82	21 2.9	14	18 33 48.64	11.082	20 6 10.7	1.92	21 0.8
15	16 37 54.82	7.648	17 27 53.4	17.21	21 2.1	15	18 38 15.30	11.139	20 6 43.4	- 0.78	21 1.3
16	16 41 0.50	+ 7.825	-17 34 50.1	-17.52	21 1.3	16	18 42 43.30	+ 11.193	-20 6 48.9	+ 0.37	21 1.8
17	16 44 10.35	7.996	17 41 53.3	17.75	21 0.6	17	18 47 12.57	11.244	20 6 26.6	1.33	21 2.4
18	16 47 24.25	8.162	17 49 1.3	17.92	20 59.9	18	18 51 43.03	11.292	20 5 36.0	2.71	21 3.0
19	16 50 42.06	8.322	17 56 12.4	18.01	20 59.3	19	18 56 14.62	11.338	20 4 16.8	3.90	21 3.6
20	16 54 3.66	8.478	18 3 25.0	18.03	20 58.8	20	19 0 47.27	11.381	20 2 28.6	5.11	21 4.2
21	16 57 28.95	+ 8.629	-18 10 37.3	-17.99	20 58.3	21	19 5 20.91	+ 11.421	-20 0 11.1	+ 6.33	21 4.8
22	17 0 57.82	8.776	18 17 48.0	17.90	20 57.9	22	19 9 55.48	11.458	19 57 23.9	7.57	21 5.5
23	17 4 30.17	8.919	18 24 55.5	17.74	20 57.5	23	19 14 30.92	11.493	19 54 6.6	8.83	21 6.2
24	17 8 5.88	9.057	18 31 58.4	17.51	20 57.2	24	19 19 7.15	11.525	19 50 19.0	10.12	21 6.9
25	17 11 44.85	9.190	18 38 55.2	17.21	20 57.0	25	19 23 44.12	11.553	19 46 0.9	11.40	21 7.6
26	17 15 26.98	+ 9.320	-18 45 44.6	-16.86	20 56.8	26	19 28 21.77	+ 11.579	-19 41 12.1	+ 12.69	21 8.3
27	17 19 12.18	9.446	18 52 25.2	16.47	20 56.7	27	19 33 0.03	11.603	19 35 52.4	13.98	21 9.0
28	17 23 0.36	9.568	18 58 55.7	16.03	20 56.6	28	19 37 38.86	11.626	19 30 1.6	15.27	21 9.7
29	17 26 51.42	9.686	19 5 14.9	15.54	20 56.5	29	19 42 18.18	11.647	19 23 39.7	16.56	21 10.4
30	17 30 45.28	9.801	19 11 21.7	15.00	20 56.5	30	19 46 57.93	11.665	19 16 46.6	17.86	21 11.1
31	17 34 41.85	+ 9.912	-19 17 14.7	-14.40	20 56.6	31	19 51 38.06	+ 11.680	-19 9 22.3	+ 19.16	21 11.8
32	17 38 41.03	+ 10.019	-19 22 52.8	-13.75	20 56.7	32	19 56 18.53	+ 11.693	-19 1 26.6	+ 20.46	21 12.5
Day of the Month.						Day of the Month.					
0 5th. 10th. 15th. 20th. 25th. 30th.						4th. 9th. 14th. 19th. 24th.					
Semidiameter 22.36 20.58 19.00 17.59 16.36 15.27 14.30						Semidiameter . . . . 13.43 12.67 11.99 11.38 10.83					
Hor. Parallax 23.02 21.19 19.57 18.13 16.85 15.72 14.72						Hor. Parallax . . . . 13.83 13.04 12.34 11.71 11.14					

NOTE.—The sign + indicates north declinations; the sign - indicates south declinations.

## GREENWICH MEAN TIME.

MARCH.						APRIL.								
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.			
Noon.	Noon.	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.	Noon.					
h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m				
1 19 42 18.18	+11.647	-19 23 39.7	+16.56	21 10.4	1 22 6 21.16	+11.381	-12 1 32.3	+52.52	21 32.1					
2 19 46 57.93	11.665	19 16 46.6	17.86	21 11.1	2 22 10 54.07	11.360	11 40 21.2	53.41	21 32.7					
3 19 51 38.06	11.680	19 9 22.3	19.16	21 11.8	3 22 15 26.49	11.339	11 18 49.3	54.27	21 33.3					
4 19 56 18.53	11.693	19 1 26.6	20.46	21 12.5	4 22 19 58.41	11.319	10 56 57.1	55.10	21 33.9					
5 20 0 59.27	11.703	18 52 59.7	21.76	21 13.3	5 22 24 29.85	11.299	10 34 45.1	55.90	21 34.5					
6 20 5 40.23	+11.711	-18 44 1.6	+23.07	21 14.0	6 22 29 0.80	+11.279	-10 12 14.1	+56.67	21 35.1					
7 20 10 21.36	11.717	18 34 32.4	24.36	21 14.7	7 22 33 31.27	11.259	9 49 24.7	57.42	21 35.7					
8 20 15 2.59	11.720	18 24 32.1	25.65	21 15.4	8 22 38 1.26	11.240	9 26 17.5	58.15	21 36.2					
9 20 19 43.88	11.721	18 14 0.9	26.93	21 16.2	9 22 42 30.78	11.221	9 2 52.9	58.86	21 36.7					
10 20 24 25.16	11.719	18 2 59.0	28.21	21 17.0	10 22 46 59.85	11.202	8 39 11.7	59.55	21 37.3					
11 20 29 6.40	+11.716	-17 51 26.7	+29.48	21 17.8	11 22 51 28.47	+11.184	-8 15 14.5	+60.21	21 37.8					
12 20 33 47.54	11.711	17 39 24.1	30.74	21 18.6	12 22 55 56.65	11.166	7 51 2.0	60.84	21 38.3					
13 20 38 28.54	11.704	17 26 51.4	31.99	21 19.3	13 23 0 24.41	11.149	7 26 34.7	61.44	21 38.8					
14 20 43 9.35	11.695	17 13 49.0	33.22	21 20.0	14 23 4 51.76	11.132	7 1 53.3	62.01	21 39.3					
15 20 47 49.94	11.685	17 0 17.3	34.43	21 20.7	15 23 9 18.72	11.116	6 36 58.5	62.55	21 39.8					
16 20 52 30.27	+11.674	-16 46 16.5	+35.63	21 21.5	16 23 13 45.31	+11.101	-6 11 50.9	+63.07	21 40.3					
17 20 57 10.31	11.662	16 31 47.0	36.82	21 22.2	17 23 18 11.55	11.087	5 46 31.1	63.56	21 40.8					
18 21 1 50.02	11.648	16 16 49.0	38.00	21 22.9	18 23 22 37.46	11.074	5 20 59.7	64.03	21 41.3					
19 21 6 29.38	11.633	16 1 23.0	39.16	21 23.6	19 23 27 3.07	11.062	4 55 17.3	64.48	21 41.7					
20 21 11 8.37	11.617	15 45 29.4	40.30	21 24.3	20 23 31 28.40	11.050	4 29 24.5	64.90	21 42.2					
21 21 15 46.96	+11.599	-15 29 8.5	+41.43	21 25.0	21 23 35 53.48	+11.039	-4 3 22.2	+65.29	21 42.7					
22 21 20 25.13	11.581	15 12 20.8	42.54	21 25.7	22 23 40 18.33	11.030	3 37 10.9	65.65	21 43.2					
23 21 25 2.87	11.562	14 55 6.8	43.63	21 26.4	23 23 44 42.98	11.022	3 10 51.2	65.98	21 43.7					
24 21 29 40.16	11.543	14 37 26.9	44.70	21 27.1	24 23 49 7.47	11.016	2 44 23.7	66.29	21 44.1					
25 21 34 16.99	11.524	14 19 21.5	45.75	21 27.7	25 23 53 31.81	11.012	2 17 49.2	66.57	21 44.5					
26 21 38 53.34	+11.504	-14 0 51.1	+46.77	21 28.4	26 23 57 56.04	+11.009	-1 51 8.2	+66.83	21 44.9					
27 21 43 29.20	11.484	13 41 56.3	47.77	21 29.1	27 0 2 20.21	11.007	1 24 21.2	67.07	21 45.4					
28 21 48 4.58	11.464	13 22 37.5	48.76	21 29.7	28 0 6 44.34	11.006	0 57 28.8	67.28	21 45.9					
29 21 52 39.47	11.444	13 2 55.2	49.73	21 30.3	29 0 11 8.45	11.006	0 30 31.8	67.46	21 46.4					
30 21 57 13.86	11.423	12 42 49.8	50.68	21 30.9	30 0 15 32.59	11.007	-0 3 30.8	67.61	21 46.8					
31 22 1 47.76	+11.402	-12 22 22.0	+51.61	21 31.5	31 0 19 56.79	+11.010	+0 23 33.3	+67.73	21 47.2					
32 22 6 21.16	+11.381	-12 1 32.3	+52.52	21 32.1	32 0 24 21.07	+11.014	+0 50 40.2	+67.82	21 47.7					
Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter.	10.33	9.87	9.46	9.09	8.74	8.43	8.14	Semidiameter.	7.87	7.63	7.40	7.19	6.99	6.80
Hor. Parallax.	10.63	10.16	9.74	9.35	9.00	8.68	8.38	Hor. Parallax.	8.10	7.85	7.62	7.40	7.20	7.01

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.								
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.			
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.				
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m			
1	0 19 56.79	+ 11.010	+ 0 23 33.3	+ 67.73	21 47.2	1	2 39 43.04	+ 11.736	+ 13 49 34.7	+ 57.72	22 5.1			
2	0 24 21.07	11.014	0 50 40.2	67.82	21 47.7	2	2 44 25.23	11.778	14 12 30.8	56.94	22 5.9			
3	0 28 45.47	11.020	1 17 49.4	67.89	21 48.2	3	2 49 8.44	11.821	14 35 7.8	56.13	22 6.7			
4	0 33 10.02	11.027	1 45 0.0	67.94	21 48.7	4	2 53 52.69	11.866	14 57 25.1	55.29	22 7.5			
5	0 37 34.76	11.035	2 12 11.2	67.97	21 49.1	5	2 58 38.00	11.911	15 19 21.9	54.42	22 8.3			
6	0 41 59.71	+ 11.045	+ 2 39 22.4	+ 67.97	21 49.6	6	3 3 24.37	+ 11.956	+ 15 40 57.2	+ 53.52	22 9.1			
7	0 46 24.91	11.056	3 6 33.0	67.94	21 50.1	7	3 8 11.81	12.001	16 2 10.5	52.59	22 10.0			
8	0 50 50.37	11.068	3 33 42.4	67.87	21 50.6	8	3 13 0.34	12.046	16 23 1.6	51.64	22 10.9			
9	0 55 16.12	11.081	4 0 49.8	67.77	21 51.1	9	3 17 49.96	12.091	16 43 29.5	50.66	22 11.8			
10	0 59 42.21	11.095	4 27 54.7	67.64	21 51.6	10	3 22 40.69	12.137	17 3 33.1	49.65	22 12.7			
11	1 4 8.67	+ 11.111	+ 4 54 56.3	+ 67.49	21 52.1	11	3 27 32.52	+ 12.183	+ 17 23 12.0	+ 48.61	22 13.6			
12	1 8 35.52	11.128	5 21 53.9	67.31	21 52.6	12	3 32 25.46	12.229	17 42 25.4	47.54	22 14.6			
13	1 13 2.80	11.146	5 48 46.6	67.10	21 53.1	13	3 37 19.50	12.275	18 1 12.9	46.43	22 15.6			
14	1 17 30.53	11.166	6 15 33.9	66.86	21 53.7	14	3 42 14.66	12.321	18 19 33.5	45.29	22 16.6			
15	1 21 58.75	11.187	6 42 15.3	66.59	21 54.2	15	3 47 10.92	12.367	18 37 26.6	44.13	22 17.6			
16	1 26 27.50	+ 11.209	+ 7 8 50.0	+ 66.30	21 54.7	16	3 52 8.28	+ 12.413	+ 18 54 51.6	+ 42.94	22 18.6			
17	1 30 56.80	11.233	7 35 17.3	65.98	21 55.2	17	3 57 6.74	12.458	19 11 47.8	41.73	22 19.7			
18	1 35 26.67	11.258	8 1 36.5	65.63	21 55.8	18	4 2 6.29	12.503	19 28 14.5	40.49	22 20.8			
19	1 39 57.15	11.284	8 27 46.9	65.25	21 56.4	19	4 7 6.91	12.548	19 44 11.1	39.22	22 21.9			
20	1 44 28.27	11.311	8 53 47.9	64.83	21 57.0	20	4 12 8.60	12.592	19 59 37.0	37.92	22 23.0			
21	1 49 0.06	+ 11.340	+ 9 19 38.8	+ 64.39	21 57.6	21	4 17 11.35	+ 12.635	+ 20 14 31.7	+ 36.60	22 24.1			
22	1 53 32.55	11.370	9 45 18.8	63.92	21 58.2	22	4 22 15.14	12.678	20 28 54.4	35.26	22 25.2			
23	1 58 5.79	11.401	10 10 47.3	63.43	21 58.8	23	4 27 19.96	12.721	20 42 44.6	33.90	22 26.4			
24	2 2 39.80	11.434	10 36 3.6	62.91	21 59.5	24	4 32 25.78	12.763	20 56 1.7	32.51	22 27.6			
25	2 7 14.61	11.468	11 1 7.1	62.36	22 0.1	25	4 37 32.58	12.804	21 8 45.2	31.10	22 28.8			
26	2 11 50.25	+ 11.503	+ 11 25 57.1	+ 61.79	22 0.8	26	4 42 40.35	+ 12.844	+ 21 20 54.5	+ 29.67	22 30.0			
27	2 16 26.74	11.539	11 50 32.9	61.19	22 1.5	27	4 47 49.07	12.883	21 32 29.2	28.22	22 31.2			
28	2 21 4.12	11.576	12 14 53.8	60.56	22 2.2	28	4 52 58.70	12.920	21 43 28.7	26.74	22 32.4			
29	2 25 42.41	11.615	12 38 59.1	59.89	22 2.9	29	4 58 9.21	12.956	21 53 52.5	25.24	22 33.6			
30	2 30 21.65	11.655	13 2 48.2	59.19	22 3.6	30	5 3 20.58	12.991	22 3 40.1	23.72	22 34.9			
31	2 35 1.85	+ 11.695	+ 13 26 20.3	+ 58.47	22 4.3	31	5 8 32.77	+ 13.025	+ 22 12 51.1	+ 22.19	22 36.2			
32	2 39 43.04	+ 11.736	+ 13 49 34.7	+ 57.72	22 5.1	32	5 13 45.74	+ 13.057	+ 22 21 24.9	+ 20.64	22 37.5			
Day of the Month.						Day of the Month.								
		5th.	10th.	15th.	20th.	25th.	30th.		4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter .		6.64	6.49	6.35	6.21	6.08	5.96	Semidiameter .	5.86	5.76	5.67	5.58	5.50	5.42
Hor. Parallax .		6.84	6.68	6.53	6.39	6.26	6.14	Hor. Parallax .	6.03	5.93	5.83	5.74	5.66	5.59

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

JULY.						AUGUST.								
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.			
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.				
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m			
1	5 8 32.77	+ 13.025	+ 22 12 51.1	+ 22.19	22 36.2	1	7 52 13.71	+ 13.040	+ 21 31 20.6	- 29.04	23 17.7			
2	5 13 45.74	13.057	22 21 24.9	20.64	22 37.5	2	7 57 26.25	13.008	21 19 25.6	30.59	23 18.9			
3	5 18 59.45	13.087	22 29 21.2	19.07	22 38.8	3	8 2 38.01	12.974	21 6 53.3	32.11	23 20.2			
4	5 24 13.86	13.114	22 36 39.6	17.47	22 40.1	4	8 7 48.98	12.939	20 53 44.1	33.62	23 21.4			
5	5 29 28.92	13.139	22 43 19.7	15.86	22 41.4	5	8 12 59.13	12.904	20 39 58.5	35.12	23 22.6			
6	5 34 44.58	+ 13.163	+ 22 49 21.2	+ 14.24	22 42.7	6	8 18 8.42	+ 12.868	+ 20 25 37.0	- 36.61	23 23.8			
7	5 40 0.80	13.185	22 54 43.7	12.61	22 44.0	7	8 23 16.81	12.831	20 10 40.0	38.09	23 25.0			
8	5 45 17.53	13.206	22 59 26.9	10.97	22 45.4	8	8 28 24.29	12.794	19 55 8.1	39.55	23 26.2			
9	5 50 34.71	13.225	23 3 30.5	9.32	22 46.7	9	8 33 30.82	12.755	19 39 1.8	40.98	23 27.4			
10	5 55 52.31	13.241	23 6 54.3	7.66	22 48.1	10	8 38 36.40	12.715	19 22 21.7	42.38	23 28.5			
11	6 1 10.25	+ 13.254	+ 23 9 38.1	+ 5.99	22 49.5	11	8 43 40.99	+ 12.673	+ 19 5 8.2	- 43.75	23 29.6			
12	6 6 28.49	13.265	23 11 41.6	4.31	22 50.9	12	8 48 44.59	12.630	18 47 22.1	45.10	23 30.7			
13	6 11 46.97	13.274	23 13 4.7	2.62	22 52.2	13	8 53 47.17	12.586	18 29 3.8	46.42	23 31.8			
14	6 17 5.64	13.281	23 13 47.2	+ 0.93	22 53.6	14	8 58 48.72	12.542	18 10 14.1	47.72	23 32.9			
15	6 22 24.45	13.286	23 13 49.1	- 0.76	22 55.0	15	9 3 49.24	12.498	17 50 53.4	48.99	23 33.9			
16	6 27 43.33	+ 13.288	+ 23 13 10.2	- 2.46	22 56.4	16	9 8 48.71	+ 12.455	+ 17 31 2.5	- 50.24	23 34.9			
17	6 33 2.24	13.288	23 11 50.6	4.16	22 57.8	17	9 13 47.13	12.412	17 10 42.0	51.47	23 35.9			
18	6 38 21.11	13.285	23 9 50.2	5.86	22 59.1	18	9 18 44.51	12.369	16 49 52.6	52.66	23 36.9			
19	6 43 39.90	13.280	23 7 9.0	7.57	23 0.5	19	9 23 40.84	12.326	16 28 34.8	53.82	23 37.9			
20	6 48 58.55	13.274	23 3 47.1	9.27	23 1.9	20	9 28 36.13	12.283	16 6 49.5	54.95	23 38.9			
21	6 54 17.00	+ 13.266	+ 22 59 44.5	- 10.96	23 3.3	21	9 33 30.39	+ 12.240	+ 15 44 37.2	- 56.06	23 39.8			
22	6 59 35.21	13.255	22 55 1.4	12.64	23 4.6	22	9 38 23.62	12.197	15 21 58.6	57.14	23 40.7			
23	7 4 53.13	13.241	22 49 37.8	14.32	23 5.9	23	9 43 15.84	12.154	14 58 54.4	58.20	23 41.6			
24	7 10 10.71	13.224	22 43 34.0	15.99	23 7.3	24	9 48 7.05	12.112	14 35 25.2	59.23	23 42.5			
25	7 15 27.90	13.206	22 36 50.1	17.65	23 8.7	25	9 52 57.27	12.071	14 11 31.8	60.23	23 43.4			
26	7 20 44.66	+ 13.187	+ 22 29 26.3	- 19.31	23 10.0	26	9 57 46.52	+ 12.031	+ 13 47 14.9	- 61.20	23 44.3			
27	7 26 0.95	13.166	22 21 22.8	20.96	23 11.3	27	10 2 34.82	11.992	13 22 35.1	62.13	23 45.1			
28	7 31 16.71	13.144	22 12 39.9	22.60	23 12.5	28	10 7 22.19	11.955	12 57 33.1	63.03	23 45.9			
29	7 36 31.91	13.121	22 3 17.9	24.23	23 13.8	29	10 12 8.65	11.918	12 32 9.7	63.90	23 46.7			
30	7 41 46.50	13.096	21 53 17.1	25.86	23 15.1	30	10 16 54.21	11.882	12 6 25.5	64.74	23 47.5			
31	7 47 0.45	+ 13.069	+ 21 42 37.9	- 27.46	23 16.4	31	10 21 38.90	+ 11.846	+ 11 40 21.3	- 65.56	23 48.3			
32	7 52 13.71	+ 13.040	+ 21 31 20.6	- 29.04	23 17.7	32	10 26 22.74	+ 11.810	+ 11 13 57.8	- 66.36	23 49.1			
Day of the Month.						Day of the Month.								
		4th.	9th.	14th.	19th.	24th.			3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter		5.36	5.30	5.24	5.19	5.15	Semidiameter		5.08	5.05	5.02	5.00	4.98	4.97
Hor. Parallax		5.52	5.46	5.40	5.35	5.30	Hor. Parallax		5.22	5.19	5.17	5.15	5.13	5.12

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	10 26 22.74	+11.810	+11 13 57.8	-66.36	23 49.1	1	12 44 19.84	+11.421	-3 26 54.8	-75.87	0 8.0
2	10 31 5.76	11.776	10 47 15.7	67.13	23 49.9	2	12 48 54.15	11.437	3 57 13.7	75.70	0 8.7
3	10 35 47.98	11.743	10 20 15.7	67.87	23 50.7	3	12 53 28.80	11.454	4 27 28.5	75.51	0 9.3
4	10 40 29.43	11.711	9 52 58.5	68.58	23 51.4	4	12 58 3.84	11.471	4 57 38.4	75.29	0 9.9
5	10 45 10.14	11.681	9 25 25.0	69.25	23 52.1	5	13 2 39.30	11.489	5 27 42.6	75.04	0 10.5
6	10 49 50.13	+11.652	+8 57 35.9	-69.88	23 52.8	6	13 7 15.23	+11.508	-5 57 40.4	-74.76	0 11.2
7	10 54 29.43	11.624	8 29 31.8	70.47	23 53.5	7	13 11 51.66	11.529	6 27 30.9	74.44	0 11.9
8	10 59 8.08	11.597	8 1 13.5	71.03	23 54.2	8	13 16 28.63	11.552	6 57 13.4	74.09	0 12.6
9	11 3 46.10	11.571	7 32 41.7	71.57	23 54.9	9	13 21 6.18	11.577	7 26 47.2	73.71	0 13.3
10	11 8 23.54	11.547	7 3 57.2	72.08	23 55.6	10	13 25 44.35	11.603	7 56 11.5	73.30	0 14.0
11	11 13 0.42	+11.525	+6 35 0.8	-72.57	23 56.2	11	13 30 23.17	+11.631	-8 25 25.5	-72.85	0 14.7
12	11 17 36.77	11.504	6 5 53.1	73.04	23 56.9	12	13 35 2.68	11.661	8 54 28.4	72.37	0 15.4
13	11 22 12.62	11.484	5 36 34.9	73.47	23 57.6	13	13 39 42.92	11.692	9 23 19.3	71.86	0 16.1
14	11 26 48.02	11.466	5 7 6.9	73.86	23 58.2	14	13 44 23.93	11.725	9 51 57.4	71.31	0 16.8
15	11 31 23.01	11.449	4 37 29.9	74.22	23 58.8	15	13 49 5.73	11.759	10 20 22.1	70.73	0 17.6
16	11 35 57.62	+11.434	+4 7 44.7	-74.55	23 59.4	16	13 53 48.36	+11.794	-10 48 32.5	-70.12	0 18.4
17	11 40 31.88	11.421	3 37 51.8	74.85	.	17	13 58 31.86	11.831	11 16 27.9	69.48	0 19.2
18	11 45 5.85	11.410	3 7 52.1	75.12	0 0.1	18	14 3 16.26	11.870	11 44 7.4	68.81	0 20.0
19	11 49 39.56	11.400	2 37 46.4	75.36	0 0.7	19	14 8 1.60	11.910	12 11 30.2	68.10	0 20.8
20	11 54 13.06	11.392	2 7 35.3	75.57	0 1.3	20	14 12 47.91	11.951	12 38 35.7	67.35	0 21.6
21	11 58 46.39	+11.386	+1 37 19.6	-75.75	0 1.9	21	14 17 35.21	+11.993	-13 5 22.9	-66.57	0 22.4
22	12 3 19.59	11.382	1 6 59.9	75.89	0 2.5	22	14 22 23.55	12.036	13 31 51.1	65.75	0 23.3
23	12 7 52.71	11.381	0 36 36.9	76.00	0 3.1	23	14 27 12.95	12.080	13 57 59.6	64.91	0 24.2
24	12 12 25.78	11.381	+0 6 11.4	76.08	0 3.7	24	14 32 3.43	12.126	14 23 47.5	64.04	0 25.1
25	12 16 58.87	11.382	-0 24 15.7	76.14	0 4.3	25	14 36 55.03	12.173	14 49 14.0	63.14	0 26.0
26	12 21 32.00	+11.384	-0 54 43.9	-76.17	0 4.9	26	14 41 47.77	+12.221	-15 14 18.4	-62.21	0 26.9
27	12 26 5.21	11.387	1 25 12.4	76.18	0 5.6	27	14 46 41.66	12.270	15 38 59.8	61.23	0 27.9
28	12 30 38.56	11.391	1 55 40.4	76.16	0 6.2	28	14 51 36.73	12.319	16 3 17.4	60.22	0 28.9
29	12 35 12.09	11.398	2 26 7.4	76.10	0 6.8	29	14 56 33.00	12.369	16 27 10.5	59.18	0 29.9
30	12 39 45.83	11.408	2 56 32.4	76.00	0 7.4	30	15 1 30.48	12.419	16 50 38.2	58.11	0 30.9
31	12 44 19.84	+11.421	-3 26 54.8	-75.87	0 8.0	31	15 6 29.19	+12.470	-17 13 39.8	-57.01	0 31.9
32	12 48 54.15	+11.437	-3 57 13.7	-75.70	0 8.7	32	15 11 29.13	+12.522	-17 36 14.5	-55.87	0 33.0
Day of the Month.						Day of the Month.					
2d. 7th. 12th. 17th. 22d. 27th.						2d. 7th. 12th. 17th. 22d. 27th.					
Semidiameter . . 4.97 4.96 4.96 4.96 4.97 4.97						Semidiameter . . 4.98 5.00 5.02 5.05 5.08 5.11					
Hor. Parallax . . 5.11 5.10 5.10 5.10 5.11 5.12						Hor. Parallax . . 5.13 5.15 5.17 5.20 5.23 5.26					

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	15 11 29.13	+ 12.522	-17 36 14.5	-55.87	0 33.0	1	17 50 4.31	+ 13.705	-24 24 56.8	- 8.59	1 13.4
2	15 16 30.32	12.574	17 58 21.4	54.70	0 34.1	2	17 55 33.37	13.716	24 28 0.6	6.72	1 15.0
3	15 21 32.76	12.627	18 19 59.8	53.49	0 35.2	3	18 1 2.64	13.724	24 30 19.5	4.84	1 16.6
4	15 26 36.44	12.679	18 41 8.8	52.25	0 36.3	4	18 6 32.06	13.728	24 31 53.3	2.96	1 18.1
5	15 31 41.38	12.731	19 1 47.7	50.98	0 37.4	5	18 12 1.55	13.728	24 32 41.8	- 1.08	1 19.6
6	15 36 47.56	+ 12.783	-19 21 55.8	-49.68	0 38.6	6	18 17 31.05	+ 13.727	-24 32 45.0	+ 0.81	1 21.1
7	15 41 54.98	12.834	19 41 32.3	48.35	0 39.8	7	18 23 0.48	13.723	24 32 2.9	2.70	1 22.7
8	15 47 3.63	12.885	20 0 36.4	46.99	0 41.0	8	18 28 29.78	13.716	24 30 35.6	4.59	1 24.3
9	15 52 13.51	12.935	20 19 7.4	45.59	0 42.2	9	18 33 58.87	13.706	24 28 23.0	6.47	1 25.8
10	15 57 24.60	12.985	20 37 4.5	44.16	0 43.4	10	18 39 27.68	13.693	24 25 25.3	8.35	1 27.3
11	16 2 36.87	+ 13.035	-20 54 26.9	-42.70	0 44.7	11	18 44 56.15	+ 13.677	-24 21 42.5	+ 10.22	1 28.8
12	16 7 50.30	13.084	21 11 13.9	41.21	0 46.0	12	18 50 24.19	13.658	24 17 14.9	12.08	1 30.4
13	16 13 4.88	13.132	21 27 24.9	39.70	0 47.3	13	18 55 51.75	13.637	24 12 2.5	13.94	1 31.9
14	16 18 20.59	13.178	21 42 59.2	38.16	0 48.6	14	19 1 18.77	13.613	24 6 5.6	15.79	1 33.4
15	16 23 37.39	13.223	21 57 56.1	36.59	0 49.9	15	19 6 45.18	13.586	23 59 24.5	17.63	1 34.9
16	16 28 55.25	+ 13.266	-22 12 15.0	-34.99	0 51.3	16	19 12 10.92	+ 13.557	-23 51 59.5	+ 19.45	1 36.4
17	16 34 14.15	13.308	22 25 55.3	33.37	0 52.7	17	19 17 35.94	13.526	23 43 51.0	21.26	1 37.9
18	16 39 34.05	13.349	22 38 56.4	31.72	0 54.1	18	19 23 0.17	13.492	23 34 59.2	23.05	1 39.4
19	16 44 54.92	13.388	22 51 17.8	30.05	0 55.5	19	19 28 23.57	13.456	23 25 24.6	24.82	1 40.8
20	16 50 16.72	13.426	23 2 58.8	28.36	0 56.9	20	19 33 46.08	13.418	23 15 7.5	26.58	1 42.2
21	16 55 39.41	+ 13.463	-23 13 58.9	-26.64	0 58.4	21	19 39 7.65	+ 13.378	-23 4 8.4	+ 28.32	1 43.6
22	17 1 2.94	13.498	23 24 17.7	24.90	0 59.8	22	19 44 28.24	13.336	22 52 27.9	30.04	1 45.0
23	17 6 27.27	13.530	23 33 54.7	23.15	1 1.2	23	19 49 47.81	13.293	22 40 6.2	31.74	1 46.4
24	17 11 52.35	13.560	23 42 49.4	21.38	1 2.7	24	19 55 6.30	13.248	22 27 4.1	33.42	1 47.8
25	17 17 18.13	13.588	23 51 1.4	19.60	1 4.2	25	20 0 23.69	13.201	22 13 22.0	35.07	1 49.1
26	17 22 44.55	+ 13.613	-23 58 30.3	-17.80	1 5.7	26	20 5 39.93	+ 13.152	-21 59 0.6	+ 36.70	1 50.4
27	17 28 11.56	13.636	24 5 15.8	15.99	1 7.2	27	20 10 55.00	13.102	21 44 0.4	38.30	1 51.8
28	17 33 39.10	13.657	24 11 17.4	14.16	1 8.7	28	20 16 8.86	13.051	21 28 21.9	39.88	1 53.1
29	17 39 7.12	13.675	24 16 35.0	12.32	1 10.2	29	20 21 21.49	12.999	21 12 5.8	41.43	1 54.4
30	17 44 35.54	13.691	24 21 8.2	10.46	1 11.8	30	20 26 32.86	12.946	20 55 12.8	42.96	1 55.6
31	17 50 4.31	+ 13.705	-24 24 56.8	- 8.59	1 13.4	31	20 31 42.94	+ 12.893	-20 37 43.6	+ 44.46	1 56.8
32	17 55 33.37	+ 13.716	-24 28 0.6	- 6.72	1 15.0	32	20 36 51.71	+ 12.838	-20 19 38.7	+ 45.93	1 58.0
Day of the Month.						Day of the Month.					
1st. 6th. 11th. 16th. 21st. 26th.						1st. 6th. 11th. 16th. 21st. 26th. 31st.					
Semidiameter . . . 5.14 5.18 5.22 5.26 5.31 5.36						Semidiameter . . . 5.42 5.48 5.54 5.61 5.69 5.77 5.86					
Hor. Parallax . . . 5.29 5.33 5.37 5.42 5.47 5.52						Hor. Parallax . . . 5.58 5.64 5.71 5.78 5.86 5.94 6.03					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.							
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.		
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.			
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m		
1	14 28 28.60	+ 5.913	13 32 42.0	- 29.62	19 47.2	1	15 42 37.26	+ 6.022	18 49 25.2	- 21.07	18 59.2		
2	14 30 50.58	5.919	13 44 30.2	29.39	19 45.7	2	15 45 1.83	6.023	18 57 47.0	20.76	18 57.7		
3	14 33 12.69	5.925	13 56 12.7	29.15	19 44.1	3	15 47 26.41	6.024	19 6 1.5	20.45	18 56.2		
4	14 35 34.94	5.930	14 7 49.5	28.91	19 42.5	4	15 49 51.00	6.025	19 14 8.5	20.14	18 54.6		
5	14 37 57.31	5.935	14 19 20.5	28.67	19 40.9	5	15 52 15.60	6.025	19 22 8.1	19.83	18 53.1		
6	14 40 19.81	+ 5.940	14 30 45.6	- 28.43	19 39.3	6	15 54 40.18	+ 6.024	19 30 0.1	- 19.52	18 51.5		
7	14 42 42.43	5.945	14 42 4.9	28.18	19 37.8	7	15 57 4.75	6.023	19 37 44.6	19.20	18 50.0		
8	14 45 5.17	5.950	14 53 18.1	27.93	19 36.2	8	15 59 29.29	6.022	19 45 21.5	18.88	18 48.5		
9	14 47 28.04	5.955	15 4 25.1	27.68	19 34.7	9	16 1 53.79	6.020	19 52 50.7	18.56	18 46.9		
10	14 49 51.02	5.960	15 15 25.9	27.42	19 33.1	10	16 4 18.24	6.018	20 0 12.2	18.24	18 45.4		
11	14 52 14.11	+ 5.964	15 26 20.5	- 27.15	19 31.6	11	16 6 42.62	+ 6.015	20 7 26.1	- 17.92	18 43.8		
12	14 54 37.31	5.968	15 37 8.7	26.88	19 30.0	12	16 9 6.92	6.011	20 14 32.2	17.60	18 42.3		
13	14 57 0.60	5.972	15 47 50.5	26.61	19 28.5	13	16 11 31.13	6.007	20 21 30.6	17.28	18 40.8		
14	14 59 23.98	5.976	15 58 25.8	26.34	19 27.0	14	16 13 55.25	6.003	20 28 21.3	16.95	18 39.2		
15	15 1 47.45	5.980	16 8 54.5	26.06	19 25.4	15	16 16 19.26	5.998	20 35 4.2	16.62	18 37.7		
16	15 4 11.01	+ 5.984	16 19 16.6	- 25.78	19 23.8	16	16 18 43.16	+ 5.993	20 41 39.3	- 16.30	18 36.1		
17	15 6 34.65	5.987	16 29 32.0	25.50	19 22.3	17	16 21 6.93	5.988	20 48 6.7	15.98	18 34.6		
18	15 8 58.37	5.990	16 39 40.6	25.22	19 20.7	18	16 23 30.57	5.982	20 54 26.4	15.66	18 33.1		
19	15 11 22.16	5.993	16 49 42.4	24.94	19 19.2	19	16 25 54.08	5.976	21 0 38.3	15.34	18 31.6		
20	15 13 46.02	5.996	16 59 37.4	24.65	19 17.6	20	16 28 17.44	5.969	21 6 42.5	15.02	18 30.0		
21	15 16 9.95	+ 5.999	17 9 25.4	- 24.36	19 16.1	21	16 30 40.64	+ 5.962	21 12 39.0	- 14.70	18 28.5		
22	15 18 33.96	6.002	17 19 6.5	24.07	19 14.5	22	16 33 3.68	5.955	21 18 27.7	14.38	18 26.9		
23	15 20 58.04	6.005	17 28 40.5	23.78	19 13.0	23	16 35 26.55	5.948	21 24 8.8	14.06	18 25.3		
24	15 23 22.18	6.008	17 38 7.5	23.48	19 11.5	24	16 37 49.24	5.941	21 29 42.2	13.74	18 23.8		
25	15 25 46.39	6.010	17 47 27.4	23.18	19 9.9	25	16 40 11.74	5.933	21 35 8.1	13.42	18 22.2		
26	15 28 10.65	+ 6.012	17 56 40.2	- 22.88	19 8.4	26	16 42 34.04	+ 5.925	21 40 26.4	- 13.10	18 20.7		
27	15 30 34.96	6.014	18 5 45.9	22.58	19 6.8	27	16 44 56.14	5.916	21 45 37.1	12.78	18 19.1		
28	15 32 59.33	6.016	18 14 44.3	22.28	19 5.3	28	16 47 18.02	5.907	21 50 40.2	12.47	18 17.5		
29	15 35 23.75	6.018	18 23 35.5	21.98	19 3.8	29	16 49 39.67	5.897	21 55 35.9	12.16	18 15.9		
30	15 37 48.22	6.020	18 32 19.4	21.68	19 2.2	30	16 52 1.07	5.886	22 0 24.1	11.85	18 14.3		
31	15 40 12.72	+ 6.021	18 40 56.0	- 21.38	19 0.7	31	16 54 22.20	+ 5.875	22 5 5.0	- 11.54	18 12.7		
32	15 42 37.26	+ 6.022	18 49 25.2	- 21.07	18 59.2	32	16 56 43.06	+ 5.863	22 9 38.5	- 11.23	18 11.1		
Day of the Month.	0	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.
Semidiameter	2.68	2.75	2.82	2.89	2.97	3.06	3.16	Semidiameter.	3.26	3.36	3.47	3.60	3.74
Hor. Parallax	4.68	4.79	4.91	5.04	5.18	5.33	5.50	Hor. Parallax.	5.67	5.86	6.06	6.27	6.50

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.



## GREENWICH MEAN TIME.

MARCH.						APRIL.							
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.		
Noon.	Noon.	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.	Noon.				
h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m			
1 16 49 39.67	+ 5.897	- 21 55 35.9	- 12.16	18 15.9	1	17 59 25.89	+ 5.244	- 23 31 39.9	- 3.94	17 23.3			
2 16 52 1.07	5.886	22 0 24.1	11.85	18 14.3	2	18 1 31.36	5.211	23 33 12.2	3.75	17 21.5			
3 16 54 22.20	5.875	22 5 5.0	11.54	18 12.7	3	18 3 36.02	5.177	23 34 40.0	3.57	17 19.6			
4 16 56 43.06	5.863	22 9 38.5	11.23	18 11.1	4	18 5 39.84	5.141	23 36 3.5	3.39	17 17.7			
5 16 59 3.64	5.851	22 14 4.6	10.93	18 9.5	5	18 7 42.79	5.104	23 37 22.9	3.22	17 15.8			
6 17 1 23.91	+ 5.838	- 22 18 23.4	- 10.63	18 7.9	6	18 9 44.85	+ 5.066	- 23 38 38.3	- 3.05	17 13.9			
7 17 3 43.86	5.824	22 22 35.0	10.33	18 6.3	7	18 11 45.98	5.027	23 39 49.9	2.89	17 11.9			
8 17 6 3.47	5.809	22 26 39.4	10.03	18 4.7	8	18 13 46.15	4.987	23 40 58.0	2.74	17 10.0			
9 17 8 22.72	5.793	22 30 36.6	9.73	18 3.1	9	18 15 45.34	4.945	23 42 2.5	2.61	17 8.0			
10 17 10 41.58	5.777	22 34 26.8	9.44	18 1.4	10	18 17 43.51	4.902	23 43 3.7	2.49	17 6.0			
11 17 13 0.04	+ 5.760	- 22 38 10.0	- 9.15	17 59.8	11	18 19 40.64	+ 4.858	- 23 44 1.8	- 2.37	17 4.0			
12 17 15 18.08	5.742	22 41 46.0	8.86	17 58.2	12	18 21 36.69	4.813	23 44 57.0	2.26	17 2.0			
13 17 17 35.68	5.723	22 45 15.1	8.57	17 56.5	13	18 23 31.64	4.767	23 45 49.6	2.15	17 0.0			
14 17 19 52.83	5.704	22 48 37.3	8.29	17 54.9	14	18 25 25.47	4.719	23 46 39.7	2.05	16 57.9			
15 17 22 9.51	5.684	22 51 52.8	8.01	17 53.2	15	18 27 18.14	4.670	23 47 27.5	1.95	16 55.8			
16 17 24 25.79	+ 5.664	- 22 55 1.6	- 7.73	17 51.5	16	18 29 9.64	+ 4.620	- 23 48 13.2	- 1.86	16 53.7			
17 17 26 41.39	5.643	22 58 3.9	7.46	17 49.8	17	18 30 59.93	4.569	23 48 57.1	1.79	16 51.6			
18 17 28 56.56	5.621	23 0 59.6	7.19	17 48.1	18	18 32 49.00	4.517	23 49 39.4	1.73	16 49.4			
19 17 31 11.20	5.598	23 3 48.8	6.93	17 46.4	19	18 34 36.81	4.464	23 50 20.3	1.68	16 47.3			
20 17 33 25.28	5.575	23 6 31.8	6.67	17 44.7	20	18 36 23.34	4.411	23 51 0.1	1.64	16 45.1			
21 17 35 38.80	+ 5.552	- 23 9 8.7	- 6.41	17 43.0	21	18 38 8.56	+ 4.356	- 23 51 38.8	- 1.61	16 42.9			
22 17 37 51.75	5.529	23 11 39.4	6.16	17 41.3	22	18 39 52.44	4.300	23 52 16.9	1.59	16 40.7			
23 17 40 4.10	5.504	23 14 4.1	5.91	17 39.6	23	18 41 34.97	4.243	23 52 54.6	1.58	16 38.5			
24 17 42 15.85	5.478	23 16 23.0	5.67	17 37.8	24	18 43 16.10	4.184	23 53 32.1	1.57	16 36.2			
25 17 44 26.97	5.451	23 18 36.3	5.44	17 36.0	25	18 44 55.80	4.124	23 54 9.6	1.57	16 33.9			
26 17 46 37.45	+ 5.423	- 23 20 44.0	- 5.21	17 34.2	26	18 46 34.05	+ 4.062	- 23 54 47.3	- 1.59	16 31.6			
27 17 48 47.28	5.395	23 22 46.2	4.99	17 32.4	27	18 48 10.82	3.999	23 55 25.7	1.62	16 29.2			
28 17 50 56.43	5.366	23 24 42.9	4.77	17 30.6	28	18 49 46.06	3.935	23 56 4.9	1.66	16 26.9			
29 17 53 4.88	5.337	23 26 34.4	4.56	17 28.8	29	18 51 19.74	3.869	23 56 45.1	1.71	16 24.5			
30 17 55 12.62	5.307	23 28 21.1	4.35	17 27.0	30	18 52 51.81	3.802	23 57 26.7	1.77	16 22.1			
31 17 57 19.63	+ 5.276	- 23 30 2.9	- 4.14	17 25.2	31	18 54 22.24	+ 3.733	- 23 58 9.9	- 1.84	16 19.6			
32 17 59 25.89	+ 5.244	- 23 31 39.9	- 3.94	17 23.3	32	18 55 50.97	+ 3.662	- 23 58 55.0	- 1.93	16 17.1			
Day of the Month.						Day of the Month.							
1st.	6th.	11th.	16th.	21st.	26th.	31st.	5th.	10th.	15th.	20th.	25th.	30th.	
"	"	"	"	"	"	"	"	"	"	"	"	"	
Semidiameter .	3.88	4.03	4.19	4.36	4.55	4.76	Semidiameter .	5.22	5.47	5.74	6.04	6.36	6.70
Hor. Parallax .	6.75	7.01	7.30	7.61	7.93	8.28	Hor. Parallax .	9.08	9.52	9.99	10.51	11.07	11.67

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	18 54 22.24	+ 3.733	-23 58 9.9	- 1.84	16 19.6	1	19 23 13.72	+ 0.622	-24 57 57.9	- 9.30	14 45.5
2	18 55 50.97	3.662	23 58 55.0	1.93	16 17.1	2	19 23 27.02	0.490	25 1 45.5	9.65	14 41.8
3	18 57 17.96	3.588	23 59 42.2	2.03	16 14.6	3	19 23 37.14	0.356	25 5 41.5	10.00	14 38.1
4	18 58 43.15	3.512	24 0 32.0	2.14	16 12.1	4	19 23 44.03	0.219	25 9 45.9	10.35	14 34.2
5	19 0 6.50	3.434	24 1 24.4	2.25	16 9.5	5	19 23 47.66	+ 0.082	25 13 58.5	10.70	14 30.3
6	19 1 27.97	+ 3.354	-24 2 19.8	- 2.37	16 6.9	6	19 23 48.00	- 0.056	-25 18 19.4	- 11.04	14 26.4
7	19 2 47.49	3.272	24 3 18.5	2.51	16 4.3	7	19 23 45.03	0.194	25 22 48.3	11.37	14 22.4
8	19 4 5.03	3.188	24 4 20.8	2.66	16 1.7	8	19 23 38.72	0.332	25 27 25.1	11.69	14 18.4
9	19 5 20.53	3.102	24 5 26.9	2.83	15 59.0	9	19 23 29.08	0.471	25 32 9.4	12.00	14 14.3
10	19 6 33.95	3.015	24 6 37.0	3.01	15 56.2	10	19 23 16.09	0.610	25 37 1.0	12.30	14 10.1
11	19 7 45.24	+ 2.926	-24 7 51.5	- 3.20	15 53.4	11	19 22 59.77	- 0.748	-25 41 59.7	- 12.59	14 5.9
12	19 8 54.35	2.835	24 9 10.7	3.40	15 50.6	12	19 22 40.11	0.886	25 47 5.2	12.86	14 1.6
13	19 10 1.25	2.742	24 10 34.8	3.61	15 47.8	13	19 22 17.14	1.024	25 52 17.1	13.11	13 57.2
14	19 11 5.89	2.646	24 12 4.1	3.83	15 44.9	14	19 21 50.89	1.161	25 57 34.9	13.35	13 52.8
15	19 12 8.22	2.548	24 13 38.9	4.07	15 41.9	15	19 21 21.40	1.296	26 2 58.1	13.57	13 48.3
16	19 13 8.21	+ 2.448	-24 15 19.3	- 4.32	15 38.9	16	19 20 48.68	- 1.429	-26 8 26.2	- 13.77	13 43.8
17	19 14 5.81	2.347	24 17 5.7	4.57	15 35.9	17	19 20 12.80	1.559	26 13 58.8	13.94	13 39.3
18	19 15 0.98	2.245	24 18 58.2	4.83	15 32.9	18	19 19 33.81	1.687	26 19 35.3	14.09	13 34.7
19	19 15 53.68	2.142	24 20 57.2	5.10	15 29.9	19	19 18 51.79	1.813	26 25 15.1	14.21	13 30.0
20	19 16 43.86	2.038	24 23 2.9	5.37	15 26.8	20	19 18 6.79	1.936	26 30 57.5	14.30	13 25.3
21	19 17 31.48	+ 1.932	-24 25 15.4	- 5.65	15 23.6	21	19 17 18.89	- 2.055	-26 36 41.9	- 14.36	13 20.5
22	19 18 16.51	1.823	24 27 35.0	5.95	15 20.4	22	19 16 28.18	2.170	26 42 27.8	14.40	13 15.7
23	19 18 58.89	1.712	24 30 1.9	6.26	15 17.1	23	19 15 34.75	2.281	26 48 14.4	14.42	13 10.9
24	19 19 38.59	1.598	24 32 36.2	6.58	15 13.8	24	19 14 38.68	2.389	26 54 1.0	14.42	13 6.0
25	19 20 15.56	1.482	24 35 18.2	6.91	15 10.4	25	19 13 40.09	2.492	26 59 46.7	14.39	13 1.1
26	19 20 49.75	+ 1.364	-24 38 8.0	- 7.24	15 7.0	26	19 12 39.06	- 2.590	-27 5 30.9	- 14.32	12 56.1
27	19 21 21.11	1.245	24 41 5.8	7.58	15 3.5	27	19 11 35.73	2.683	27 11 12.9	14.21	12 51.1
28	19 21 49.59	1.124	24 44 11.7	7.92	15 0.1	28	19 10 30.19	2.772	27 16 51.9	14.06	12 46.1
29	19 22 15.26	1.001	24 47 25.7	8.26	14 56.6	29	19 9 22.60	2.856	27 22 27.0	13.87	12 41.1
30	19 22 37.74	0.877	24 50 48.0	8.60	14 52.9	30	19 8 13.08	2.933	27 27 57.6	13.65	12 36.0
31	19 22 57.28	+ 0.751	-24 54 18.7	- 8.95	14 49.2	31	19 7 1.79	- 3.003	-27 33 22.9	- 13.40	12 30.9
32	19 23 13.72	+ 0.622	-24 57 57.9	- 9.30	14 45.5	32	19 5 48.88	- 3.066	-27 38 42.0	- 13.13	12 25.7
Day of the Month.						Day of the Month.					
5th. 10th. 15th. 20th. 25th. 30th.						4th. 9th. 14th. 19th. 24th. 29th.					
Semidiameter . . . 7.07 7.46 7.89 8.33 8.80 9.29						Semidiameter . . . 9.79 10.29 10.78 11.24 11.64 11.98					
Hor. Parallax . . . 12.31 13.00 13.73 14.51 15.32 16.18						Hor. Parallax . . . 17.05 17.91 18.77 19.58 20.29 20.87					

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	19 7 1.79	-3.003	-27 33 22.9	-13.40	12 30.9	1	18 33 37.01	-1.206	-28 53 18.2	+1.15	9 56.1
2	19 5 48.88	3.066	27 38 42.0	13.13	12 25.7	2	18 33 9.89	1.036	28 52 45.8	1.55	9 51.7
3	19 4 34.54	3.122	27 43 54.3	12.84	12 20.5	3	18 32 46.40	0.903	28 52 3.9	1.94	9 47.4
4	19 3 18.96	3.171	27 48 59.0	12.52	12 15.3	4	18 32 26.57	0.748	28 51 12.6	2.32	9 43.2
5	19 2 2.35	3.211	27 53 55.3	12.17	12 10.1	5	18 32 10.47	0.592	28 50 12.6	2.69	9 39.0
6	19 0 44.90	-3.242	-27 58 42.4	-11.79	12 4.9	6	18 31 58.12	-0.435	-28 49 4.0	+3.04	9 34.9
7	18 59 26.83	3.263	28 3 19.8	11.38	11 59.7	7	18 31 49.55	0.277	28 47 47.1	3.38	9 30.8
8	18 58 8.35	3.275	28 7 46.9	10.93	11 54.4	8	18 31 44.78	-0.119	28 46 22.1	3.70	9 26.8
9	18 56 49.68	3.277	28 12 3.2	10.45	11 49.1	9	18 31 43.83	+0.041	28 44 49.4	4.01	9 22.9
10	18 55 31.05	3.270	28 16 8.3	9.95	11 43.9	10	18 31 46.70	0.200	28 43 9.3	4.31	9 19.1
11	18 54 12.69	-3.254	-28 20 1.7	-9.45	11 38.7	11	18 31 53.40	+0.359	-28 41 22.0	+4.60	9 15.3
12	18 52 54.83	3.229	28 23 42.9	8.94	11 33.5	12	18 32 3.91	0.517	28 39 27.8	4.89	9 11.5
13	18 51 37.69	3.195	28 27 11.8	8.43	11 28.3	13	18 32 18.20	0.674	28 37 26.9	5.17	9 7.8
14	18 50 21.50	3.151	28 30 28.0	7.91	11 23.1	14	18 32 36.25	0.830	28 35 19.5	5.44	9 4.2
15	18 49 6.46	3.098	28 33 31.4	7.38	11 17.9	15	18 32 58.05	0.985	28 33 5.7	5.70	9 0.7
16	18 47 52.79	-3.036	-28 36 21.6	-6.84	11 12.8	16	18 33 23.54	+1.138	-28 30 45.6	+5.95	8 57.2
17	18 46 40.70	2.966	28 38 58.7	6.29	11 7.7	17	18 33 52.69	1.290	28 28 19.6	6.20	8 53.8
18	18 45 30.39	2.888	28 41 22.7	5.74	11 2.6	18	18 34 25.45	1.439	28 25 47.6	6.45	8 50.4
19	18 44 22.04	2.803	28 43 33.7	5.18	10 57.5	19	18 35 1.75	1.586	28 23 9.8	6.70	8 47.1
20	18 43 15.83	2.711	28 45 31.5	4.63	10 52.5	20	18 35 41.54	1.730	28 20 26.1	6.94	8 43.9
21	18 42 11.92	-2.612	-28 47 16.5	-4.09	10 47.6	21	18 36 24.74	+1.871	-28 17 36.7	+7.18	8 40.7
22	18 41 10.47	2.507	28 48 48.8	3.56	10 42.7	22	18 37 11.30	2.009	28 14 41.7	7.42	8 37.5
23	18 40 11.60	2.396	28 50 8.5	3.05	10 37.8	23	18 38 1.15	2.144	28 11 40.9	7.65	8 34.4
24	18 39 15.46	2.280	28 51 15.7	2.55	10 32.9	24	18 38 54.23	2.277	28 8 34.5	7.89	8 31.4
25	18 38 22.15	2.159	28 52 10.8	2.05	10 28.1	25	18 39 50.48	2.408	28 5 22.2	8.13	8 28.5
26	18 37 31.80	-2.034	-28 52 53.9	-1.56	10 23.3	26	18 40 49.84	+2.536	-28 2 4.2	+8.37	8 25.6
27	18 36 44.50	1.905	28 53 25.4	1.08	10 18.6	27	18 41 52.24	2.662	27 58 40.4	8.61	8 22.7
28	18 36 0.35	1.772	28 53 45.5	0.61	10 14.0	28	18 42 57.64	2.786	27 55 10.8	8.86	8 19.8
29	18 35 19.43	1.635	28 53 54.5	-0.15	10 9.4	29	18 44 5.97	2.908	27 51 35.2	9.11	8 17.0
30	18 34 41.86	1.495	28 53 52.8	+0.30	10 4.9	30	18 45 17.19	3.028	27 47 53.6	9.36	8 14.2
31	18 34 7.69	-1.352	-28 53 40.6	+0.73	10 0.5	31	18 46 31.25	+3.145	-27 44 6.0	+9.61	8 11.5
32	18 33 37.01	-1.206	-28 53 18.2	+1.15	9 56.1	32	18 47 48.09	+3.259	-27 40 12.3	+9.87	8 8.9

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter	12.23	12.37	12.40	12.31	12.13	11.87	Semidiameter	11.54	11.16	10.76	10.34	9.92	9.50
Hor. Parallax	21.29	21.54	21.59	21.44	21.13	20.67	Hor. Parallax	20.10	19.44	18.74	18.00	17.27	16.54

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations are increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	18 47 48.09	+ 3.259	-27 40 12.3	+ 9.87	8 8.9	1	19 43 4.39	+ 5.605	-24 47 4.5	+ 19.66	7 6.3
2	18 49 7.65	3.371	27 36 12.3	10.13	8 6.3	2	19 45 19.46	5.651	24 39 8.0	20.05	7 4.6
3	18 50 29.88	3.481	27 32 6.0	10.40	8 3.8	3	19 47 35.62	5.696	24 31 2.1	20.44	7 2.9
4	18 51 54.72	3.589	27 27 53.3	10.67	8 1.3	4	19 49 52.85	5.740	24 22 46.7	20.83	7 1.2
5	18 53 22.13	3.695	27 23 34.0	10.94	7 58.9	5	19 52 11.10	5.782	24 14 21.9	21.23	6 59.6
6	18 54 52.05	+ 3.798	-27 19 8.1	+ 11.22	7 56.5	6	19 54 30.34	+ 5.822	-24 5 47.5	+ 21.63	6 58.0
7	18 56 24.43	3.899	27 14 35.6	11.50	7 54.1	7	19 56 50.54	5.861	23 57 3.6	22.03	6 56.4
8	18 57 59.20	3.998	27 9 56.3	11.79	7 51.7	8	19 59 11.66	5.899	23 48 10.1	22.43	6 54.8
9	18 59 36.31	4.095	27 5 10.0	12.08	7 49.4	9	20 1 33.67	5.935	23 39 6.9	22.83	6 53.2
10	19 1 15.71	4.189	27 0 16.7	12.38	7 47.1	10	20 3 56.53	5.970	23 29 54.1	23.23	6 51.7
11	19 2 57.33	+ 4.280	-26 55 16.2	+ 12.68	7 44.8	11	20 6 20.20	+ 6.003	-23 20 31.4	+ 23.64	6 50.2
12	19 4 41.13	4.369	26 50 8.4	12.98	7 42.6	12	20 8 44.64	6.034	23 10 59.1	24.05	6 48.7
13	19 6 27.03	4.455	26 44 53.1	13.29	7 40.4	13	20 11 9.82	6.064	23 1 17.2	24.46	6 47.2
14	19 8 14.97	4.539	26 39 30.2	13.60	7 38.3	14	20 13 35.70	6.093	22 51 25.6	24.86	6 45.7
15	19 10 4.88	4.620	26 33 59.7	13.92	7 36.2	15	20 16 2.25	6.120	22 41 24.4	25.26	6 44.2
16	19 11 56.70	+ 4.698	-26 28 21.7	+ 14.25	7 34.1	16	20 18 29.41	+ 6.145	-22 31 13.5	+ 25.66	6 42.7
17	19 13 50.37	4.773	26 22 35.8	14.58	7 32.1	17	20 20 57.16	6.168	22 20 53.0	26.06	6 41.2
18	19 15 45.82	4.846	26 16 41.8	14.92	7 30.1	18	20 23 25.46	6.190	22 10 22.8	26.46	6 39.7
19	19 17 43.00	4.917	26 10 39.6	15.26	7 28.2	19	20 25 54.29	6.211	21 59 43.1	26.86	6 38.2
20	19 19 41.84	4.985	26 4 29.3	15.60	7 26.3	20	20 28 23.60	6.231	21 48 53.8	27.26	6 36.8
21	19 21 42.28	+ 5.051	-25 58 10.7	+ 15.95	7 24.4	21	20 30 53.37	+ 6.249	-21 37 55.1	+ 27.65	6 35.4
22	19 23 44.27	5.114	25 51 43.7	16.30	7 22.4	22	20 33 23.57	6.267	21 26 46.9	28.04	6 33.9
23	19 25 47.77	5.175	25 45 8.1	16.66	7 20.5	23	20 35 54.19	6.284	21 15 29.3	28.43	6 32.4
24	19 27 52.72	5.235	25 38 23.9	17.02	7 18.6	24	20 38 25.19	6.300	21 4 2.4	28.82	6 31.0
25	19 29 59.07	5.293	25 31 30.9	17.39	7 16.8	25	20 40 56.57	6.315	20 52 26.1	29.21	6 29.6
26	19 32 6.78	+ 5.349	-25 24 29.1	+ 17.76	7 15.0	26	20 43 28.30	+ 6.329	-20 40 40.6	+ 29.59	6 28.2
27	19 34 15.81	5.403	25 17 18.3	18.13	7 13.2	27	20 46 0.36	6.342	20 28 45.8	29.97	6 26.8
28	19 36 26.12	5.456	25 9 58.5	18.51	7 11.4	28	20 48 32.73	6.354	20 16 41.8	30.35	6 25.4
29	19 38 37.69	5.507	25 2 29.7	18.89	7 9.7	29	20 51 5.39	6.366	20 4 28.7	30.73	6 24.0
30	19 40 50.46	5.557	24 54 51.7	19.27	7 8.0	30	20 53 38.34	6.377	19 52 6.5	31.11	6 22.6
31	19 43 4.39	+ 5.605	-24 47 4.5	+ 19.66	7 6.3	31	20 56 11.55	+ 6.388	-19 39 35.4	+ 31.48	6 21.2
32	19 45 19.46	+ 5.651	-24 39 8.0	+ 20.05	7 4.6	32	20 58 45.02	+ 6.399	-19 26 55.4	+ 31.85	6 19.9
Day of the Month. 2d. 7th. 12th. 17th. 22d. 27th.						Day of the Month. 2d. 7th. 12th. 17th. 22d. 27th.					
Semidiameter . . . 9.09 8.70 8.33 7.97 7.64 7.32						Semidiameter . . . 7.02 6.73 6.46 6.21 5.97 5.75					
Hor. Parallax . . . 15.84 15.15 14.50 13.88 13.30 12.74						Hor. Parallax . . . 12.21 11.72 11.26 10.82 10.40 10.01					

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	20 58 45.02	+6.399	-19 26 55.4	+31.85	6 19.9	1	22 16 15.90	+6.455	-12 6 8.3	+40.83	5 39.2
2	21 1 18.72	6.409	19 14 6.5	32.22	6 18.5	2	22 18 50.80	6.453	11 49 45.7	41.04	5 37.8
3	21 3 52.65	6.418	19 1 8.8	32.58	6 17.1	3	22 21 25.65	6.451	11 33 18.0	41.25	5 36.4
4	21 6 26.79	6.426	18 48 2.4	32.94	6 15.7	4	22 24 0.44	6.449	11 16 45.2	41.46	5 35.1
5	21 9 1.12	6.434	18 34 47.4	33.30	6 14.3	5	22 26 35.18	6.447	11 0 7.6	41.66	5 33.7
6	21 11 35.63	+6.441	-18 21 23.8	+33.66	6 13.0	6	22 29 9.87	+6.444	-10 43 25.2	+41.86	5 32.4
7	21 14 10.31	6.447	18 7 51.8	34.01	6 11.6	7	22 31 44.51	6.442	10 26 38.2	42.05	5 31.0
8	21 16 45.15	6.453	17 54 11.4	34.36	6 10.2	8	22 34 19.08	6.439	10 9 46.8	42.23	5 29.6
9	21 19 20.12	6.458	17 40 22.8	34.70	6 8.9	9	22 36 53.59	6.436	9 52 51.1	42.41	5 28.2
10	21 21 55.20	6.462	17 26 26.0	35.03	6 7.5	10	22 39 28.02	6.433	9 35 51.2	42.58	5 26.8
11	21 24 30.38	+6.466	-17 12 21.2	+35.36	6 6.2	11	22 42 2.38	+6.430	-9 18 47.5	+42.74	5 25.5
12	21 27 5.65	6.469	16 58 8.6	35.68	6 4.8	12	22 44 36.67	6.427	9 1 39.9	42.89	5 24.1
13	21 29 40.98	6.472	16 43 48.3	36.00	6 3.4	13	22 47 10.87	6.424	8 44 28.6	43.03	5 22.7
14	21 32 16.35	6.474	16 29 20.3	36.31	6 2.1	14	22 49 44.98	6.420	8 27 13.9	43.17	5 21.4
15	21 34 51.76	6.476	16 14 44.8	36.62	6 0.8	15	22 52 19.00	6.416	8 9 56.0	43.31	5 20.0
16	21 37 27.20	+6.477	-16 0 2.0	+36.93	5 59.5	16	22 54 52.94	+6.412	-7 52 34.8	+43.44	5 18.7
17	21 40 2.64	6.477	15 45 12.0	37.23	5 58.1	17	22 57 26.79	6.408	7 35 10.7	43.57	5 17.4
18	21 42 38.08	6.476	15 30 15.0	37.52	5 56.7	18	23 0 0.55	6.404	7 17 43.8	43.69	5 16.0
19	21 45 13.51	6.476	15 15 11.0	37.81	5 55.4	19	23 2 34.23	6.401	7 0 14.2	43.79	5 14.6
20	21 47 48.92	6.475	15 0 0.1	38.09	5 54.0	20	23 5 7.82	6.398	6 42 42.1	43.89	5 13.2
21	21 50 24.30	+6.474	-14 44 42.6	+38.37	5 52.7	21	23 7 41.34	+6.395	-6 25 7.5	+43.98	5 11.8
22	21 52 59.65	6.473	14 29 18.5	38.64	5 51.3	22	23 10 14.78	6.392	6 7 30.8	44.07	5 10.4
23	21 55 34.96	6.471	14 13 48.0	38.91	5 49.9	23	23 12 48.15	6.389	5 49 52.0	44.15	5 9.0
24	21 58 10.24	6.469	13 58 11.2	39.17	5 48.6	24	23 15 21.45	6.386	5 32 11.2	44.23	5 7.6
25	22 0 45.48	6.467	13 42 28.3	39.43	5 47.2	25	23 17 54.69	6.384	5 14 28.6	44.30	5 6.2
26	22 3 20.67	+6.465	-13 26 39.3	+39.68	5 45.9	26	23 20 27.88	+6.382	-4 56 44.4	+44.37	5 4.8
27	22 5 55.81	6.463	13 10 44.5	39.92	5 44.5	27	23 23 1.01	6.380	4 38 58.6	44.43	5 3.4
28	22 8 30.91	6.461	12 54 43.9	40.16	5 43.2	28	23 25 34.10	6.378	4 21 11.4	44.49	5 2.0
29	22 11 5.95	6.459	12 38 37.5	40.39	5 41.8	29	23 28 7.15	6.376	4 3 22.9	44.54	5 0.6
30	22 13 40.95	6.457	12 22 25.6	40.61	5 40.5	30	23 30 40.16	6.375	3 45 33.3	44.59	4 59.2
31	22 16 15.90	+6.455	-12 6 8.3	+40.83	5 39.2	31	23 33 13.15	+6.374	-3 27 42.6	+44.63	4 57.8
32	22 18 50.80	+6.453	-11 49 45.7	+41.04	5 37.8	32	23 35 46.11	+6.373	-3 9 51.1	+44.66	4 56.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	5.54	5.33	5.14	4.96	4.79	4.63	Semidiameter .	4.48	4.33	4.19	4.06	3.94	3.82	3.71
Hor. Parallax . .	9.64	9.29	8.95	8.64	8.34	8.06	Hor. Parallax .	7.79	7.54	7.30	7.07	6.86	6.65	6.45

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	6 23 52.76	-1.463	+23 14 50.0	+1.20	11 41.7	1	6 8 37.38	-0.855	+23 25 13.2	+0.51	9 24.7
2	6 23 17.70	1.458	23 15 18.5	1.18	11 37.2	2	6 8 17.25	0.823	23 25 25.6	0.50	9 20.5
3	6 22 42.76	1.452	23 15 46.5	1.15	11 32.7	3	6 7 57.88	0.791	23 25 37.9	0.48	9 16.3
4	6 22 7.97	1.445	23 16 13.9	1.12	11 28.2	4	6 7 39.28	0.759	23 25 49.6	0.47	9 12.0
5	6 21 33.36	1.437	23 16 40.7	1.10	11 23.7	5	6 7 21.47	0.726	23 26 0.9	0.46	9 7.8
6	6 20 58.97	-1.429	+23 17 6.9	+1.07	11 19.2	6	6 7 4.45	-0.693	+23 26 11.9	+0.45	9 3.6
7	6 20 24.80	1.419	23 17 32.5	1.05	11 14.7	7	6 6 48.23	0.659	23 26 22.6	0.44	8 59.4
8	6 19 50.90	1.408	23 17 57.5	1.03	11 10.2	8	6 6 32.83	0.625	23 26 33.1	0.43	8 55.2
9	6 19 17.28	1.395	23 18 22.0	1.00	11 5.7	9	6 6 18.25	0.591	23 26 43.3	0.42	8 51.0
10	6 18 43.97	1.380	23 18 45.9	0.98	11 1.2	10	6 6 4.50	0.556	23 26 53.3	0.41	8 46.8
11	6 18 11.01	-1.365	+23 19 9.2	+0.95	10 56.7	11	6 5 51.59	-0.520	+23 27 3.0	+0.40	8 42.7
12	6 17 38.42	1.349	23 19 31.9	0.93	10 52.2	12	6 5 39.53	0.485	23 27 12.5	0.39	8 38.6
13	6 17 6.22	1.332	23 19 54.0	0.91	10 47.8	13	6 5 28.32	0.449	23 27 21.8	0.38	8 34.5
14	6 16 34.43	1.315	23 20 15.4	0.88	10 43.4	14	6 5 17.96	0.413	23 27 30.9	0.38	8 30.4
15	6 16 3.08	1.296	23 20 36.3	0.86	10 38.9	15	6 5 8.46	0.377	23 27 39.8	0.37	8 26.3
16	6 15 32.19	-1.276	+23 20 56.6	+0.83	10 34.4	16	6 4 59.84	-0.341	+23 27 48.6	+0.36	8 22.2
17	6 15 1.79	1.255	23 21 16.4	0.81	10 30.0	17	6 4 52.09	0.305	23 27 57.2	0.35	8 18.2
18	6 14 31.89	1.234	23 21 35.7	0.79	10 25.6	18	6 4 45.20	0.269	23 28 5.6	0.34	8 14.1
19	6 14 2.53	1.212	23 21 54.4	0.77	10 21.2	19	6 4 39.18	0.233	23 28 13.7	0.34	8 10.1
20	6 13 33.72	1.189	23 22 12.6	0.74	10 16.8	20	6 4 34.04	0.197	23 28 21.8	0.33	8 6.1
21	6 13 5.48	-1.164	+23 22 30.2	+0.72	10 12.4	21	6 4 29.77	-0.161	+23 28 29.7	+0.33	8 2.1
22	6 12 37.84	1.138	23 22 47.3	0.70	10 8.0	22	6 4 26.38	0.124	23 28 37.5	0.32	7 58.1
23	6 12 10.81	1.112	23 23 3.9	0.68	10 3.6	23	6 4 23.86	0.087	23 28 45.1	0.31	7 54.2
24	6 11 44.40	1.086	23 23 20.0	0.66	9 59.2	24	6 4 22.21	0.050	23 28 52.7	0.31	7 50.2
25	6 11 18.62	1.060	23 23 35.7	0.64	9 54.9	25	6 4 21.43	-0.013	23 29 0.1	0.30	7 46.3
26	6 10 53.49	-1.033	+23 23 50.9	+0.62	9 50.6	26	6 4 21.52	+0.023	+23 29 7.3	+0.30	7 42.3
27	6 10 29.04	1.005	23 24 5.6	0.60	9 46.2	27	6 4 22.47	0.058	23 29 14.3	0.29	7 38.4
28	6 10 5.28	0.976	23 24 19.9	0.59	9 41.9	28	6 4 24.28	0.094	23 29 21.3	0.28	7 34.5
29	6 9 42.22	0.946	23 24 33.8	0.57	9 37.6	29	6 4 26.95	0.130	23 29 28.1	0.28	7 30.6
30	6 9 19.88	0.916	23 24 47.4	0.55	9 33.3	30	6 4 30.48	0.166	23 29 34.7	0.27	7 26.7
31	6 8 58.26	-0.886	+23 25 0.5	+0.53	9 29.0	31	6 4 34.87	+0.201	+23 29 41.1	+0.27	7 22.9
32	6 8 37.38	-0.855	+23 25 13.2	+0.51	9 24.7	32	6 4 40.11	+0.237	+23 29 47.5	+0.26	7 19.1
Day of the Month.		8d.	10th.	18th.	26th.	Day of the Month.		8d.	11th.	19th.	27th.
Semidiameter . . . . .		22.49	22.36	22.12	21.80	Semidiameter . . . . .		21.40	20.95	20.47	19.97
Horizontal Parallax . . . . .		2.10	2.09	2.07	2.04	Horizontal Parallax . . . . .		2.00	1.96	1.91	1.87

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	6 4 26.95	+0.130	+23 29 28.1	+0.28	7 30.6	1	6 12 32.77	+1.134	+23 31 5.5	-0.10	5 36.9
2	6 4 30.48	0.166	23 29 34.7	0.27	7 26.7	2	6 13 0.30	1.161	23 31 2.8	0.12	5 33.4
3	6 4 34.87	0.201	23 29 41.1	0.27	7 22.9	3	6 13 28.48	1.188	23 30 59.5	0.15	5 30.0
4	6 4 40.11	0.237	23 29 47.5	0.26	7 19.1	4	6 13 57.32	1.215	23 30 55.7	0.17	5 26.6
5	6 4 46.19	0.273	23 29 53.7	0.25	7 15.3	5	6 14 26.81	1.242	23 30 51.3	0.19	5 23.1
6	6 4 53.11	+0.308	+23 29 59.7	+0.25	7 11.5	6	6 14 56.93	+1.268	+23 30 46.3	-0.22	5 19.7
7	6 5 0.87	0.342	23 30 5.4	0.24	7 7.7	7	6 15 27.68	1.294	23 30 40.6	0.25	5 16.3
8	6 5 9.48	0.377	23 30 11.0	0.23	7 3.9	8	6 15 59.06	1.320	23 30 34.3	0.28	5 12.9
9	6 5 18.92	0.412	23 30 16.4	0.22	7 0.1	9	6 16 31.05	1.345	23 30 27.3	0.30	5 9.5
10	6 5 29.19	0.446	23 30 21.7	0.21	6 56.3	10	6 17 3.64	1.370	23 30 19.6	0.33	5 6.1
11	6 5 40.28	+0.480	+23 30 26.8	+0.20	6 52.6	11	6 17 36.83	+1.395	+23 30 11.3	-0.36	5 2.7
12	6 5 52.21	0.514	23 30 31.7	0.19	6 48.9	12	6 18 10.61	1.420	23 30 2.3	0.39	4 59.3
13	6 6 4.94	0.548	23 30 36.3	0.18	6 45.2	13	6 18 44.98	1.444	23 29 52.5	0.42	4 55.9
14	6 6 18.48	0.582	23 30 40.7	0.17	6 41.5	14	6 19 19.91	1.468	23 29 41.9	0.45	4 52.5
15	6 6 32.83	0.615	23 30 44.9	0.16	6 37.8	15	6 19 55.40	1.491	23 29 30.6	0.48	4 49.2
16	6 6 47.99	+0.648	+23 30 48.8	+0.15	6 34.1	16	6 20 31.47	+1.514	+23 29 18.5	-0.51	4 45.9
17	6 7 3.93	0.681	23 30 52.5	0.14	6 30.4	17	6 21 8.08	1.536	23 29 5.6	0.55	4 42.6
18	6 7 20.65	0.713	23 30 55.9	0.13	6 26.7	18	6 21 45.21	1.558	23 28 51.9	0.59	4 39.3
19	6 7 38.15	0.745	23 30 59.0	0.12	6 23.1	19	6 22 22.87	1.580	23 28 37.3	0.62	4 36.0
20	6 7 56.43	0.777	23 31 1.8	0.11	6 19.5	20	6 23 1.06	1.601	23 28 21.8	0.66	4 32.7
21	6 8 15.46	+0.808	+23 31 4.3	+0.10	6 15.9	21	6 23 39.76	+1.622	+23 28 5.4	-0.70	4 29.4
22	6 8 35.24	0.839	23 31 6.4	0.09	6 12.3	22	6 24 18.96	1.643	23 27 48.1	0.74	4 26.1
23	6 8 55.77	0.870	23 31 8.2	0.07	6 8.7	23	6 24 58.65	1.664	23 27 29.9	0.78	4 22.8
24	6 9 17.02	0.901	23 31 9.6	0.05	6 5.1	24	6 25 38.84	1.684	23 27 10.8	0.82	4 19.6
25	6 9 39.00	0.932	23 31 10.6	0.04	6 1.5	25	6 26 19.50	1.704	23 26 50.7	0.86	4 16.3
26	6 10 1.70	+0.962	+23 31 11.2	+0.02	5 58.0	26	6 27 0.62	+1.723	+23 26 29.6	-0.90	4 13.0
27	6 10 25.12	0.992	23 31 11.5	0.00	5 54.5	27	6 27 42.20	1.742	23 26 7.5	0.94	4 9.8
28	6 10 49.28	1.021	23 31 11.3	-0.02	5 50.9	28	6 28 24.24	1.761	23 25 44.4	0.98	4 6.6
29	6 11 14.13	1.050	23 31 10.6	0.04	5 47.4	29	6 29 6.72	1.779	23 25 20.3	1.02	4 3.4
30	6 11 39.67	1.078	23 31 9.4	0.06	5 43.9	30	6 29 49.64	1.797	23 24 55.1	1.06	4 0.2
31	6 12 5.90	+1.106	+23 31 7.7	-0.08	5 40.4	31	6 30 32.99	+1.815	+23 24 28.8	-1.11	3 57.0
32	6 12 32.77	+1.134	+23 31 5.5	-0.10	5 36.9	32	6 31 16.77	+1.833	+23 24 1.5	-1.16	3 53.8
Day of the Month.		7th.	15th.	23d.	31st.	Day of the Month.		8th.	16th.	24th.	
Semidiameter . . . . .		19.46	18.97	18.49	18.03	Semidiameter . . . . .		17.60	17.21	16.85	
Horizontal Parallax . . . . .		1.82	1.77	1.73	1.69	Horizontal Parallax . . . . .		1.65	1.61	1.57	

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	6 30 32.99	+1.815	+23 24 28.8	-1.11	3 57.0	1	6 55 52.38	+2.222	+23 0 53.7	-2.75	2 29.2
2	6 31 16.77	1.833	23 24 1.5	1.16	3 53.8	2	6 56 45.81	2.231	22 59 46.8	2.81	2 17.2
3	6 32 0.98	1.850	23 23 33.1	1.21	3 50.6	3	6 57 39.45	2.239	22 58 38.6	2.87	2 14.2
4	6 32 45.59	1.867	23 23 3.5	1.25	3 47.4	4	6 58 33.30	2.247	22 57 28.8	2.93	2 11.1
5	6 33 30.59	1.884	*23 22 32.8	1.30	3 44.2	5	6 59 27.33	2.255	22 56 17.6	2.99	2 8.1
6	6 34 15.99	+1.900	+23 22 1.0	-1.35	3 41.0	6	7 0 21.55	+2.263	+22 55 5.0	-3.05	2 5.1
7	6 35 1.80	1.916	23 21 28.1	1.40	3 37.8	7	7 1 15.96	2.271	22 53 51.1	3.11	2 2.1
8	6 35 47.98	1.932	23 20 54.0	1.45	3 34.6	8	7 2 10.55	2.278	22 52 35.7	3.17	1 59.0
9	6 36 34.54	1.948	23 20 18.7	1.50	3 31.5	9	7 3 5.31	2.285	22 51 18.9	3.23	1 56.0
10	6 37 21.47	1.963	23 19 42.2	1.55	3 28.4	10	7 4 0.23	2.292	22 50 0.6	3.29	1 53.0
11	6 38 8.76	+1.978	+23 19 4.5	-1.60	3 25.2	11	7 4 55.32	+2.299	+22 48 40.9	-3.35	1 50.0
12	6 38 56.41	1.993	23 18 25.6	1.65	3 22.0	12	7 5 50.56	2.305	22 47 19.7	3.41	1 46.9
13	6 39 44.40	2.007	23 17 45.4	1.70	3 18.9	13	7 6 45.94	2.311	22 45 57.1	3.47	1 43.9
14	6 40 32.73	2.021	23 17 4.0	1.75	3 15.8	14	7 7 41.46	2.317	22 44 33.1	3.53	1 40.9
15	6 41 21.40	2.035	23 16 21.3	1.80	3 12.6	15	7 8 37.12	2.322	22 43 7.8	3.59	1 37.9
16	6 42 10.39	+2.048	+23 15 37.4	-1.85	3 9.5	16	7 9 32.90	+2.327	+22 41 40.9	-3.65	1 34.9
17	6 42 59.70	2.061	23 14 52.2	1.90	3 6.4	17	7 10 28.80	2.332	22 40 12.6	3.71	1 31.9
18	6 43 49.33	2.074	23 14 5.7	1.96	3 3.3	18	7 11 24.82	2.337	22 38 42.9	3.77	1 28.9
19	6 44 39.26	2.086	23 13 17.9	2.01	3 0.2	19	7 12 20.96	2.341	22 37 11.9	3.83	1 25.9
20	6 45 29.47	2.098	23 12 28.8	2.06	2 57.1	20	7 13 17.19	2.345	22 35 39.4	3.89	1 22.9
21	6 46 19.96	+2.110	+23 11 38.3	-2.12	2 54.0	21	7 14 13.52	+2.349	+22 34 5.5	-3.95	1 19.9
22	6 47 10.73	2.121	23 10 46.5	2.18	2 51.0	22	7 15 9.94	2.353	22 32 30.1	4.01	1 16.9
23	6 48 1.78	2.132	23 9 53.4	2.24	2 47.9	23	7 16 6.45	2.356	22 30 53.3	4.07	1 13.9
24	6 48 53.09	2.143	23 8 58.9	2.29	2 44.8	24	7 17 3.04	2.359	22 29 15.2	4.13	1 10.9
25	6 49 44.66	2.154	23 8 3.1	2.35	2 41.7	25	7 17 59.70	2.362	22 27 35.7	4.19	1 7.9
26	6 50 36.48	+2.164	+23 7 5.9	-2.41	2 38.7	26	7 18 56.43	+2.365	+22 25 54.8	-4.24	1 4.9
27	6 51 28.54	2.174	23 6 7.3	2.47	2 35.6	27	7 19 53.23	2.368	22 24 12.5	4.29	1 2.0
28	6 52 20.84	2.184	23 5 7.3	2.53	2 32.5	28	7 20 50.10	2.371	22 22 28.9	4.35	0 59.0
29	6 53 13.38	2.194	23 4 6.0	2.58	2 29.4	29	7 21 47.02	2.373	22 20 43.9	4.41	0 56.0
30	6 54 6.17	2.204	23 3 3.3	2.63	2 26.4	30	7 22 43.99	2.375	22 18 57.5	4.47	0 53.0
31	6 54 59.17	+2.213	+23 1 59.2	-2.69	2 23.3	31	7 23 41.02	+2.377	+22 17 9.6	-4.52	0 50.0
32	6 55 52.38	+2.222	+23 0 53.7	-2.75	2 20.2	32	7 24 38.10	+2.379	+22 15 20.5	-4.57	0 47.0
Day of the Month.		2d.	10th.	18th.	26th.	Day of the Month.		3d.	11th.	19th.	27th.
Semidiameter . . . . .		16.51	16.21	15.96	15.73	Semidiameter . . . . .		15.54	15.39	15.25	15.16
Horizontal Parallax . . . . .		1.54	1.52	1.49	1.47	Horizontal Parallax . . . . .		1.45	1.44	1.43	1.42

NOTE.—The sign + indicates north declinations; the sign - indicates south declinations.



## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	7 23 41.02	+2.377	+22 17 9.6	-4.52	0 50.0	1	7 53 4.93	+2.331	+21 11 18.9	-6.00	23 14.4
2	7 24 38.10	2.379	22 15 20.5	4.57	0 47.0	2	7 54 0.82	2.326	21 8 54.4	6.04	23 11.4
3	7 25 35.22	2.381	22 13 30.0	4.63	0 44.0	3	7 54 56.59	2.321	21 6 29.1	6.08	23 8.4
4	7 26 32.37	2.382	22 11 38.2	4.69	0 41.0	4	7 55 52.24	2.316	21 4 3.0	6.11	23 5.4
5	7 27 29.55	2.383	22 9 45.1	4.75	0 38.1	5	7 56 47.77	2.311	21 1 36.0	6.14	23 2.4
6	7 28 26.76	+2.384	+22 7 50.6	-4.80	0 35.1	6	7 57 43.18	+2.306	+20 59 8.2	-6.17	22 59.4
7	7 29 23.08	2.385	22 5 54.9	4.85	0 32.1	7	7 58 38.44	2.300	20 56 39.7	6.20	22 56.4
8	7 30 21.22	2.386	22 3 57.9	4.91	0 29.1	8	7 59 33.56	2.294	20 54 10.5	6.23	22 53.4
9	7 31 18.47	2.386	22 1 59.6	4.96	0 26.2	9	8 0 28.53	2.288	20 51 40.5	6.26	22 50.3
10	7 32 15.72	2.386	22 0 0.0	5.01	0 23.2	10	8 1 23.35	2.281	20 49 9.8	6.29	22 47.3
11	7 33 12.06	+2.385	+21 57 59.2	-5.06	0 20.2	11	8 2 18.01	+2.274	+20 46 38.5	-6.32	22 44.2
12	7 34 10.19	2.384	21 55 57.2	5.11	0 17.2	12	8 3 12.50	2.267	20 44 6.6	6.35	22 41.2
13	7 35 7.41	2.383	21 53 53.9	5.16	0 14.2	13	8 4 6.82	2.260	20 41 34.0	6.38	22 38.1
14	7 36 4.61	2.382	21 51 49.4	5.21	0 11.2	14	8 5 0.97	2.253	20 39 0.8	6.40	22 35.1
15	7 37 1.78	2.381	21 49 43.7	5.26	0 8.2	15	8 5 54.94	2.245	20 36 27.1	6.42	22 32.0
16	7 37 58.92	+2.380	+21 47 36.8	-5.31	0 5.2	16	8 6 48.72	+2.237	+20 33 52.9	-6.44	22 29.0
17	7 38 56.03	2.379	21 45 28.7	5.36	0 2.3	17	8 7 42.31	2.229	20 31 18.2	6.46	22 26.0
18	7 39 53.09	2.377	21 43 19.5	5.41	23 56.3	18	8 8 35.70	2.221	20 28 43.0	6.48	22 22.9
19	7 40 50.10	2.375	21 41 9.2	5.46	23 53.3	19	8 9 28.89	2.213	20 26 7.3	6.50	22 19.9
20	7 41 47.06	2.373	21 38 57.7	5.51	23 50.3	20	8 10 21.87	2.204	20 23 31.2	6.51	22 16.8
21	7 42 43.97	+2.371	+21 36 45.1	-5.55	23 47.3	21	8 11 14.65	+2.195	+20 20 54.8	-6.52	22 13.8
22	7 43 40.81	2.368	21 34 31.6	5.59	23 44.3	22	8 12 7.22	2.186	20 18 18.0	6.54	22 10.7
23	7 44 37.58	2.365	21 32 16.9	5.64	23 41.3	23	8 12 59.57	2.177	20 15 40.9	6.55	22 7.7
24	7 45 34.28	2.362	21 30 1.1	5.68	23 38.4	24	8 13 51.69	2.168	20 13 3.5	6.56	22 4.6
25	7 46 30.92	2.359	21 27 44.2	5.72	23 35.4	25	8 14 43.59	2.158	20 10 25.8	6.57	22 1.5
26	7 47 27.48	+2.355	+21 25 26.3	-5.76	23 32.4	26	8 15 35.26	+2.148	+20 7 47.9	-6.58	21 58.5
27	7 48 23.95	2.351	21 23 7.5	5.80	23 29.4	27	8 16 26.70	2.138	20 5 9.8	6.59	21 55.4
28	7 49 20.33	2.347	21 20 47.7	5.84	23 26.4	28	8 17 17.89	2.128	20 2 31.6	6.59	21 52.3
29	7 50 16.63	2.343	21 18 26.9	5.88	23 23.4	29	8 18 8.83	2.118	19 59 53.3	6.60	21 49.2
30	7 51 12.83	2.339	21 16 5.2	5.92	23 20.4	30	8 18 59.53	2.107	19 57 14.8	6.60	21 46.1
31	7 52 8.93	+2.335	+21 13 42.5	-5.96	23 17.4	31	8 19 49.97	+2.096	+19 54 36.3	-6.61	21 43.0
32	7 53 4.93	+2.331	+21 11 18.9	-6.00	23 14.4	32	8 20 40.14	+2.085	+19 51 57.7	-6.61	21 39.9
Day of the Month.						Day of the Month.					
		5th.	13th.	21st.	29th.			6th.	14th.	22d.	30th.
Semidiameter . . . . .		15.09	15.07	15.06	15.09	Semidiameter . . . . .		15.16	15.24	15.37	15.52
Horizontal Parallax . . . .		1.41	1.41	1.40	1.41	Horizontal Parallax . . . .		1.42	1.43	1.44	1.45

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	8 20 40.14	+2.085	+19 51 57.7	-6.61	21 39.9	1	8 43 13.23	+1.637	+18 35 34.6	-5.87	20 4.2
2	8 21 30.04	2.074	19 49 19.1	6.61	21 36.8	2	8 43 52.30	1.618	18 33 14.3	5.82	20 0.9
3	8 22 19.68	2.062	19 46 40.5	6.60	21 33.7	3	8 44 30.91	1.599	18 30 55.4	5.77	19 57.6
4	8 23 9.03	2.050	19 44 1.9	6.60	21 30.6	4	8 45 9.05	1.580	18 28 37.8	5.71	19 54.3
5	8 23 58.09	2.038	19 41 23.5	6.60	21 27.5	5	8 45 46.73	1.560	18 26 21.5	5.65	19 51.0
6	8 24 46.85	+2.026	+19 38 45.3	-6.59	21 24.3	6	8 46 23.93	+1.540	+18 24 6.6	-5.59	19 47.7
7	8 25 35.32	2.013	19 36 7.4	6.58	21 21.2	7	8 47 0.64	1.519	18 21 53.2	5.53	19 44.4
8	8 26 23.49	2.000	19 33 29.6	6.57	21 18.1	8	8 47 36.86	1.498	18 19 41.3	5.47	19 41.0
9	8 27 11.34	1.987	19 30 52.1	6.56	21 14.9	9	8 48 12.58	1.477	18 17 31.0	5.40	19 37.7
10	8 27 58.86	1.974	19 28 14.9	6.55	21 11.7	10	8 48 47.79	1.456	18 15 22.3	5.33	19 34.4
11	8 28 46.06	+1.960	+19 25 37.9	-6.53	21 8.6	11	8 49 22.48	+1.434	+18 13 15.3	-5.26	19 31.0
12	8 29 32.93	1.946	19 23 1.4	6.51	21 5.5	12	8 49 56.65	1.412	18 11 10.0	5.19	19 27.6
13	8 30 19.46	1.932	19 20 25.4	6.49	21 2.3	13	8 50 30.31	1.390	18 9 6.4	5.12	19 24.2
14	8 31 5.65	1.918	19 17 49.8	6.47	20 59.1	14	8 51 3.43	1.368	18 7 4.6	5.04	19 20.8
15	8 31 51.50	1.903	19 15 14.7	6.45	20 55.9	15	8 51 36.00	1.346	18 5 4.7	4.96	19 17.4
16	8 32 36.99	+1.888	+19 12 40.2	-6.43	20 52.7	16	8 52 8.03	+1.324	+18 3 6.7	-4.88	19 14.0
17	8 33 22.12	1.873	19 10 6.3	6.41	20 49.5	17	8 52 39.52	1.301	18 1 10.6	4.80	19 10.6
18	8 34 6.88	1.858	19 7 32.9	6.38	20 46.3	18	8 53 10.45	1.278	17 59 16.5	4.72	19 7.2
19	8 34 51.28	1.842	19 5 0.1	6.35	20 43.1	19	8 53 40.81	1.254	17 57 24.4	4.63	19 3.8
20	8 35 35.31	1.826	19 2 28.1	6.32	20 39.9	20	8 54 10.61	1.230	17 55 34.3	4.54	19 0.3
21	8 36 18.95	+1.810	+18 59 56.9	-6.28	20 36.7	21	8 54 39.84	+1.206	+17 53 46.3	-4.45	18 56.9
22	8 37 2.20	1.794	18 57 26.5	6.24	20 33.5	22	8 55 8.49	1.181	17 52 0.5	4.36	18 53.4
23	8 37 45.07	1.778	18 54 56.8	6.20	20 30.3	23	8 55 36.54	1.156	17 50 16.9	4.27	18 49.9
24	8 38 27.54	1.761	18 52 28.0	6.16	20 27.1	24	8 56 4.00	1.131	17 48 35.6	4.18	18 46.4
25	8 39 9.61	1.744	18 50 0.2	6.12	20 23.8	25	8 56 30.86	1.106	17 46 56.5	4.08	18 42.9
26	8 39 51.27	+1.727	+18 47 33.3	-6.08	20 20.5	26	8 56 57.11	+1.080	+17 45 19.8	-3.98	18 39.4
27	8 40 32.52	1.710	18 45 7.4	6.04	20 17.3	27	8 57 22.74	1.054	17 43 45.5	3.88	18 35.9
28	8 41 13.35	1.692	18 42 42.5	6.00	20 14.1	28	8 57 47.74	1.028	17 42 13.6	3.78	18 32.4
29	8 41 53.74	1.674	18 40 18.7	5.96	20 10.8	29	8 58 12.12	1.002	17 40 44.2	3.68	18 28.9
30	8 42 33.70	1.656	18 37 56.1	5.92	20 7.5	30	8 58 35.86	0.976	17 39 17.3	3.57	18 25.3
31	8 43 13.23	+1.637	+18 35 34.6	-5.87	20 4.2	31	8 58 58.95	+0.949	+17 37 53.0	-3.46	18 21.7
32	8 43 52.30	+1.618	+18 33 14.3	-5.82	20 0.9	32	8 59 21.39	+0.922	+17 36 31.3	-3.35	18 18.1
Day of the Month.						Day of the Month.					
7th.						1st.					
15th.						9th.					
23d.						17th.					
25th.						25th.					
Semidiameter . . . . .						Semidiameter . . . . .					
Horizontal Parallax . . . . .						Horizontal Parallax . . . . .					
15.71 15.94 16.20						16.48 16.81 17.17 17.56					
1.47 1.49 1.51						1.54 1.57 1.60 1.64					
NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.											

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.						
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.		
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m	
1	8 59 21.39	+0.922	+17 36 31.3	-3.35	18 18.1	1	9 5 1.83	-0.003	+17 18 57.6	+0.59	16 25.6	
2	8 59 43.17	0.894	17 35 12.2	3.24	18 14.6	2	9 5 1.35	0.037	17 19 13.4	0.73	16 21.7	
3	9 0 4.28	0.866	17 33 55.8	3.13	18 11.0	3	9 5 0.07	0.071	17 19 32.6	0.87	16 17.7	
4	9 0 24.71	0.837	17 32 42.2	3.01	18 7.4	4	9 4 57.98	0.105	17 19 55.2	1.01	16 13.7	
5	9 0 44.46	0.808	17 31 31.4	2.89	18 3.8	5	9 4 55.09	0.138	17 20 21.3	1.16	16 9.7	
6	9 1 3.53	+0.779	+17 30 23.5	-2.77	18 0.2	6	9 4 51.41	-0.171	+17 20 50.8	+1.30	16 5.7	
7	9 1 21.90	0.750	17 29 18.4	2.65	17 56.6	7	9 4 46.94	0.204	17 21 23.8	1.45	16 1.7	
8	9 1 39.56	0.721	17 28 16.2	2.53	17 52.9	8	9 4 41.67	0.237	17 22 0.2	1.59	15 57.7	
9	9 1 56.51	0.692	17 27 17.0	2.41	17 49.2	9	9 4 35.59	0.270	17 22 40.0	1.73	15 53.7	
10	9 2 12.76	0.662	17 26 20.7	2.29	17 45.6	10	9 4 28.73	0.303	17 23 23.1	1.87	15 49.6	
11	9 2 28.28	+0.632	+17 25 27.5	-2.16	17 41.9	11	9 4 21.09	-0.335	+17 24 9.5	+2.01	15 45.5	
12	9 2 43.08	0.602	17 24 37.3	2.03	17 38.2	12	9 4 12.68	0.367	17 24 59.3	2.15	15 41.4	
13	9 2 57.16	0.572	17 23 50.2	1.90	17 34.4	13	9 4 3.48	0.399	17 25 52.4	2.28	15 37.3	
14	9 3 10.53	0.541	17 23 6.2	1.77	17 30.7	14	9 3 53.51	0.431	17 26 48.8	2.41	15 33.2	
15	9 3 23.15	0.510	17 22 25.4	1.64	17 27.0	15	9 3 42.77	0.463	17 27 48.3	2.55	15 29.1	
16	9 3 35.03	+0.479	+17 21 47.7	-1.51	17 23.3	16	9 3 31.27	-0.495	+17 28 51.0	+2.68	15 25.0	
17	9 3 46.17	0.448	17 21 13.2	1.38	17 19.5	17	9 3 18.99	0.527	17 29 56.9	2.81	15 20.9	
18	9 3 56.57	0.417	17 20 41.8	1.24	17 15.7	18	9 3 5.97	0.558	17 31 5.9	2.94	15 16.7	
19	9 4 6.22	0.386	17 20 13.8	1.10	17 11.9	19	9 2 52.21	0.589	17 32 18.0	3.07	15 12.5	
20	9 4 15.11	0.354	17 19 49.0	0.97	17 8.1	20	9 2 37.71	0.620	17 33 33.1	3.19	15 8.3	
21	9 4 23.23	+0.322	+17 19 27.5	-0.83	17 4.3	21	9 2 22.47	-0.650	+17 34 51.3	+3.31	15 4.1	
22	9 4 30.59	0.290	17 19 9.3	0.70	17 0.5	22	9 2 6.51	0.680	17 36 12.3	3.43	14 59.9	
23	9 4 37.19	0.258	17 18 54.5	0.56	16 56.7	23	9 1 49.83	0.710	17 37 36.2	3.55	14 55.7	
24	9 4 43.01	0.226	17 18 43.0	0.42	16 52.9	24	9 1 32.44	0.740	17 39 3.0	3.67	14 51.5	
25	9 4 48.06	0.194	17 18 34.9	0.28	16 49.0	25	9 1 14.33	0.769	17 40 32.6	3.78	14 47.3	
26	9 4 52.32	+0.162	+17 18 30.1	-0.14	16 45.1	26	9 0 55.54	-0.797	+17 42 4.8	+3.89	14 43.0	
27	9 4 55.80	0.129	17 18 28.8	0.00	16 41.2	27	9 0 36.06	0.825	17 43 39.7	4.00	14 38.7	
28	9 4 58.49	0.096	17 18 30.9	+0.15	16 37.3	28	9 0 15.90	0.853	17 45 17.2	4.11	14 34.4	
29	9 5 0.39	0.063	17 18 36.4	0.30	16 33.4	29	8 59 55.08	0.880	17 46 57.3	4.22	14 30.1	
30	9 5 1.51	+0.030	17 18 45.2	0.44	16 29.5	30	8 59 33.62	0.907	17 48 39.8	4.32	14 25.8	
31	9 5 1.83	-0.003	+17 18 57.6	+0.59	16 25.6	31	8 59 11.52	-0.933	+17 50 24.6	+4.41	14 21.5	
32	9 5 1.35	-0.037	+17 19 13.4	+0.73	16 21.7	32	8 58 48.78	-0.959	+17 52 11.8	+4.50	14 17.2	
Day of the Month.		2d. 10th.		18th.	26th.	Day of the Month.		4th.	12th.	20th.	28th.	36th.
Semidiameter . . . .		"	"	"	"	Semidiameter . . . .		"	"	"	"	"
Horizontal Parallax . .		17.97	18.41	18.87	19.33	Horizontal Parallax . .		19.80	20.25	20.67	21.05	21.37
		1.68	1.72	1.76	1.81			1.85	1.89	1.93	1.96	2.00

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.							
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.		
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.			
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m		
1	22 50 31.26	+0.740	-9 25 24.7	+4.82	4 9.9	1	23 1 40.05	+1.028	-8 14 8.1	+6.51	2 19.1		
2	22 50 49.18	0.752	9 23 28.2	4.89	4 6.3	2	23 2 4.79	1.034	8 11 31.5	6.55	2 15.6		
3	22 51 7.38	0.764	9 21 30.2	4.96	4 2.6	3	23 2 29.68	1.040	8 8 54.0	6.58	2 12.1		
4	22 51 25.86	0.776	9 19 30.5	5.02	3 59.0	4	23 2 54.72	1.046	8 6 15.7	6.62	2 8.6		
5	22 51 44.61	0.787	9 17 29.1	5.09	3 55.4	5	23 3 19.90	1.052	8 3 36.6	6.66	2 5.1		
6	22 52 3.64	+0.798	-9 15 26.1	+5.16	3 51.8	6	23 3 45.22	+1.058	-8 0 56.6	+6.70	2 1.6		
7	22 52 22.93	0.809	9 13 21.6	5.23	3 48.2	7	23 4 10.69	1.064	7 58 15.8	6.73	1 58.1		
8	22 52 42.49	0.820	9 11 15.5	5.29	3 44.6	8	23 4 36.28	1.069	7 55 34.3	6.76	1 54.6		
9	22 53 2.31	0.831	9 9 7.9	5.35	3 41.0	9	23 5 1.99	1.074	7 52 52.1	6.79	1 51.1		
10	22 53 22.39	0.842	9 6 58.8	5.41	3 37.4	10	23 5 27.83	1.079	7 50 9.2	6.82	1 47.6		
11	22 53 42.72	+0.853	-9 4 48.1	+5.47	3 33.8	11	23 5 53.79	+1.084	-7 47 25.6	+6.84	1 44.1		
12	22 54 3.30	0.863	9 2 36.0	5.53	3 30.2	12	23 6 19.86	1.088	7 44 41.4	6.86	1 40.6		
13	22 54 24.12	0.873	9 0 22.5	5.59	3 26.6	13	23 6 46.03	1.092	7 41 56.6	6.88	1 37.1		
14	22 54 45.19	0.883	8 58 7.5	5.65	3 23.1	14	23 7 12.30	1.096	7 39 11.2	6.91	1 33.6		
15	22 55 6.49	0.893	8 55 51.1	5.71	3 19.5	15	23 7 38.68	1.100	7 36 25.2	6.93	1 30.1		
16	22 55 28.02	+0.902	-8 53 33.4	+5.77	3 15.9	16	23 8 5.15	+1.104	-7 33 38.7	+6.95	1 26.6		
17	22 55 49.77	0.911	8 51 14.4	5.82	3 12.3	17	23 8 31.70	1.108	7 30 51.7	6.97	1 23.1		
18	22 56 11.75	0.920	8 48 54.1	5.87	3 8.8	18	23 8 58.33	1.111	7 28 4.3	6.99	1 19.6		
19	22 56 33.95	0.929	8 46 32.5	5.92	3 5.2	19	23 9 25.05	1.114	7 25 16.4	7.01	1 16.1		
20	22 56 56.36	0.938	8 44 9.7	5.97	3 1.6	20	23 9 51.84	1.117	7 22 28.1	7.03	1 12.6		
21	22 57 18.97	+0.946	-8 41 45.6	+6.02	2 58.0	21	23 10 18.70	+1.120	-7 19 39.4	+7.05	1 9.1		
22	22 57 41.79	0.954	8 39 20.3	6.07	2 54.5	22	23 10 45.62	1.123	7 16 50.4	7.06	1 5.6		
23	22 58 4.80	0.962	8 36 53.8	6.12	2 50.9	23	23 11 12.61	1.126	7 14 1.0	7.07	1 2.1		
24	22 58 28.00	0.970	8 34 26.2	6.17	2 47.4	24	23 11 39.66	1.128	7 11 11.3	7.08	0 58.6		
25	22 58 51.38	0.978	8 31 57.6	6.22	2 43.9	25	23 12 6.76	1.130	7 8 21.4	7.09	0 55.1		
26	22 59 14.95	+0.986	-8 29 27.9	+6.27	2 40.4	26	23 12 33.90	+1.132	-7 5 31.3	+7.10	0 51.6		
27	22 59 38.71	0.994	8 26 57.1	6.31	2 36.8	27	23 13 1.09	1.134	7 2 41.0	7.11	0 48.2		
28	23 0 2.64	1.001	8 24 25.3	6.35	2 33.3	28	23 13 28.33	1.136	6 59 50.4	7.11	0 44.7		
29	23 0 26.74	1.008	8 21 52.5	6.39	2 29.7	29	23 13 55.60	1.137	6 56 59.7	7.11	0 41.2		
30	23 0 51.02	1.015	8 19 18.6	6.43	2 26.2	30	23 14 22.90	1.138	6 54 8.8	7.12	0 37.7		
31	23 1 15.46	+1.022	-8 16 43.8	+6.47	2 22.6	31	23 14 50.23	+1.139	-6 51 17.8	+7.12	0 34.3		
32	23 1 40.05	+1.028	-8 14 8.1	+6.51	2 19.1	32	23 15 17.59	+1.140	-6 48 26.7	+7.13	0 30.8		
Day of the Month.			2d.	10th.	18th.	26th.	Day of the Month.			2d.	11th.	19th.	27th.
Semidiameter . . . . .			"	"	"	"	Semidiameter . . . . .			"	"	"	"
Horizontal Parallax . . . . .			7.73	7.65	7.57	7.51	Horizontal Parallax . . . . .			7.45	7.41	7.38	7.37
			0.87	0.86	0.85	0.85				0.84	0.83	0.83	0.83

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	23 13 55.60	+ 1.137	-6 56 59.7	+ 7.11	0 41.2	1	23 27 57.04	+ 1.097	-5 29 52.0	+ 6.75	22 49.8
2	23 14 22.90	1.138	6 54 8.8	7.12	0 37.7	2	23 28 23.33	1.093	5 27 10.3	6.72	22 46.3
3	23 14 50.23	1.139	6 51 17.8	7.12	0 34.3	3	23 28 49.53	1.089	5 24 29.3	6.69	22 42.9
4	23 15 17.59	1.140	6 48 26.7	7.13	0 30.8	4	23 29 15.63	1.085	5 21 49.0	6.66	22 39.4
5	23 15 44.97	1.141	6 45 35.6	7.13	0 27.3	5	23 29 41.63	1.081	5 19 9.5	6.63	22 35.9
6	23 16 12.36	+ 1.141	-6 42 44.5	+ 7.13	0 23.8	6	23 30 7.52	+ 1.077	-5 16 30.8	+ 6.60	22 32.4
7	23 16 39.77	1.142	6 39 53.3	7.13	0 20.4	7	23 30 33.30	1.072	5 13 52.9	6.57	22 28.8
8	23 17 7.19	1.142	6 37 2.1	7.13	0 16.9	8	23 30 58.97	1.067	5 11 15.8	6.53	22 25.3
9	23 17 34.62	1.143	6 34 11.0	7.12	0 13.4	9	23 31 24.52	1.062	5 8 39.6	6.49	22 21.8
10	23 18 2.05	1.143	6 31 20.0	7.12	0 9.9	10	23 31 49.94	1.057	5 6 4.3	6.45	22 18.3
11	23 18 29.48	+ 1.143	-6 28 29.0	+ 7.11	0 6.5	11	23 32 15.23	+ 1.052	-5 3 29.9	+ 6.41	22 14.8
12	23 18 56.90	1.142	6 25 38.1	7.11	0 3.1	12	23 32 40.40	1.046	5 0 56.5	6.37	22 11.3
13	23 19 24.31	1.142	6 22 47.4	7.10	23 56.1	13	23 33 5.43	1.040	4 58 24.1	6.33	22 7.8
14	23 19 51.70	1.141	6 19 56.9	7.10	23 52.6	14	23 33 30.32	1.034	4 55 52.7	6.28	22 4.3
15	23 20 19.07	1.140	6 17 6.7	7.09	23 49.2	15	23 33 55.06	1.028	4 53 22.4	6.24	22 0.7
16	23 20 46.42	+ 1.139	-6 14 16.6	+ 7.08	23 45.7	16	23 34 19.66	+ 1.022	-4 50 53.1	+ 6.20	21 57.2
17	23 21 13.73	1.138	6 11 26.9	7.07	23 42.2	17	23 34 44.10	1.016	4 48 24.9	6.16	21 53.7
18	23 21 41.00	1.136	6 8 37.5	7.06	23 38.7	18	23 35 8.39	1.009	4 45 57.8	6.11	21 50.2
19	23 22 8.24	1.134	6 5 48.4	7.05	23 35.2	19	23 35 32.52	1.002	4 43 31.9	6.06	21 46.6
20	23 22 35.44	1.132	6 2 59.6	7.03	23 31.7	20	23 35 56.49	0.995	4 41 7.1	6.01	21 43.1
21	23 23 2.59	+ 1.130	-6 0 11.2	+ 7.01	23 28.2	21	23 36 20.29	+ 0.988	-4 38 43.6	+ 5.96	21 39.6
22	23 23 29.69	1.128	5 57 23.3	6.99	23 24.7	22	23 36 43.92	0.981	4 36 21.3	5.91	21 36.0
23	23 23 56.73	1.126	5 54 35.8	6.97	23 21.3	23	23 37 7.37	0.974	4 34 0.2	5.86	21 32.4
24	23 24 23.71	1.123	5 51 48.7	6.95	23 17.8	24	23 37 30.65	0.966	4 31 40.2	5.80	21 28.9
25	23 24 50.63	1.120	5 49 2.2	6.93	23 14.3	25	23 37 53.75	0.959	4 29 21.6	5.75	21 25.3
26	23 25 17.49	+ 1.117	-5 46 16.2	+ 6.91	23 10.8	26	23 38 16.66	+ 0.951	-4 27 4.4	+ 5.70	21 21.7
27	23 25 44.28	1.114	5 43 30.6	6.89	23 7.3	27	23 38 39.39	0.943	4 24 48.5	5.64	21 18.1
28	23 26 11.00	1.111	5 40 45.7	6.87	23 3.8	28	23 39 1.93	0.935	4 22 33.9	5.58	21 14.6
29	23 26 37.63	1.108	5 38 1.4	6.84	23 0.3	29	23 39 24.27	0.927	4 20 20.7	5.52	21 11.1
30	23 27 4.18	1.105	5 35 17.7	6.81	22 56.8	30	23 39 46.41	0.919	4 18 8.9	5.46	21 7.5
31	23 27 30.65	+ 1.101	-5 32 34.5	+ 6.78	22 53.3	31	23 40 8.35	+ 0.911	-4 15 58.5	+ 5.40	21 3.9
32	23 27 57.04	+ 1.097	-5 29 52.0	+ 6.75	22 49.8	32	23 40 30.10	+ 0.902	-4 13 49.5	+ 5.34	21 0.4
Day of the Month.		7th.	15th.	23d.	31st.	Day of the Month.		8th.	16th.	24th.	
Semidiameter . . . . .		7.36	7.37	7.38	7.40	Semidiameter . . . . .		7.43	7.48	7.53	
Horizontal Parallax . . . . .		0.83	0.83	0.83	0.83	Horizontal Parallax . . . . .		0.84	0.84	0.85	

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	23 40 8.35	+0.911	-4 15 58.5	+5.40	21 3.9	1	23 49 29.65	+0.577	-3 22 28.2	+3.09	19 11.2
2	23 40 30.10	0.902	4 13 49.5	5.34	21 0.4	2	23 49 43.33	0.564	3 21 15.1	3.00	19 7.5
3	23 40 51.65	0.893	4 11 42.0	5.28	20 56.8	3	23 49 56.71	0.551	3 20 4.1	2.91	19 3.8
4	23 41 12.98	0.884	4 9 36.0	5.22	20 53.2	4	23 50 9.78	0.538	3 18 55.2	2.82	19 0.1
5	23 41 34.09	0.875	4 7 31.5	5.16	20 49.6	5	23 50 22.53	0.525	3 17 48.5	2.73	18 56.4
6	23 41 54.99	+0.866	-4 5 28.6	+5.10	20 46.0	6	23 50 34.96	+0.512	-3 16 44.0	+2.64	18 52.7
7	23 42 15.66	0.857	4 3 27.2	5.03	20 42.4	7	23 50 47.06	0.498	3 15 41.8	2.55	18 49.0
8	23 42 36.10	0.847	4 1 27.5	4.96	20 38.8	8	23 50 58.84	0.484	3 14 41.7	2.46	18 45.3
9	23 42 56.31	0.837	3 59 29.3	4.89	20 35.2	9	23 51 10.29	0.470	3 13 43.8	2.37	18 41.5
10	23 43 16.30	0.827	3 57 32.7	4.82	20 31.6	10	23 51 21.41	0.456	3 12 48.1	2.28	18 37.7
11	23 43 36.05	+0.817	-3 55 37.8	+4.75	20 28.0	11	23 51 32.20	+0.442	-3 11 54.7	+2.19	18 34.0
12	23 43 55.55	0.807	3 53 44.6	4.68	20 24.4	12	23 51 42.65	0.428	3 11 3.5	2.09	18 30.2
13	23 44 14.80	0.797	3 51 53.2	4.61	20 20.8	13	23 51 52.76	0.414	3 10 14.6	1.99	18 26.4
14	23 44 33.81	0.787	3 50 3.5	4.54	20 17.2	14	23 52 2.53	0.400	3 9 28.0	1.90	18 22.6
15	23 44 52.56	0.776	3 48 15.5	4.47	20 13.6	15	23 52 11.96	0.386	3 8 43.6	1.80	18 18.9
16	23 45 11.05	+0.765	-3 46 29.3	+4.40	20 10.0	16	23 52 21.04	+0.372	-3 8 1.7	+1.71	18 15.1
17	23 45 29.28	0.754	3 44 44.9	4.32	20 6.3	17	23 52 29.77	0.358	3 7 22.1	1.61	18 11.3
18	23 45 47.25	0.743	3 43 2.4	4.24	20 2.7	18	23 52 38.16	0.343	3 6 44.8	1.51	18 7.5
19	23 46 4.96	0.732	3 41 21.7	4.16	19 59.1	19	23 52 46.21	0.329	3 6 9.7	1.41	18 3.7
20	23 46 22.40	0.721	3 39 42.9	4.08	19 55.4	20	23 52 53.90	0.314	3 5 37.0	1.31	17 59.9
21	23 46 39.56	+0.710	-3 38 5.9	+4.00	19 51.7	21	23 53 1.24	+0.299	-3 5 6.7	+1.21	17 56.1
22	23 46 56.45	0.699	3 36 30.8	3.92	19 48.1	22	23 53 8.22	0.284	3 4 38.7	1.11	17 52.3
23	23 47 13.06	0.687	3 34 57.7	3.84	19 44.4	23	23 53 14.85	0.269	3 4 13.1	1.01	17 48.5
24	23 47 29.39	0.675	3 33 26.5	3.76	19 40.7	24	23 53 21.12	0.254	3 3 49.8	0.92	17 44.7
25	23 47 45.44	0.663	3 31 57.2	3.68	19 37.0	25	23 53 27.03	0.239	3 3 28.9	0.82	17 40.8
26	23 48 1.21	+0.651	-3 30 29.8	+3.60	19 33.4	26	23 53 32.59	+0.224	-3 3 10.4	+0.72	17 36.9
27	23 48 16.69	0.639	3 29 4.4	3.52	19 29.7	27	23 53 37.79	0.209	3 2 54.2	0.62	17 33.1
28	23 48 31.87	0.627	3 27 41.1	3.43	19 26.0	28	23 53 42.62	0.194	3 2 40.4	0.52	17 29.2
29	23 48 46.76	0.614	3 26 19.8	3.34	19 22.3	29	23 53 47.09	0.179	3 2 29.0	0.42	17 25.3
30	23 49 1.36	0.602	3 25 0.5	3.26	19 18.6	30	23 53 51.20	0.164	3 2 20.0	0.32	17 21.4
31	23 49 15.66	+0.590	-3 23 43.3	+3.18	19 14.9	31	23 53 54.95	+0.148	-3 2 13.4	+0.22	17 17.5
32	23 49 29.65	+0.577	-3 22 28.2	+3.09	19 11.2	32	23 53 58.32	+0.133	-3 2 9.2	+0.12	17 13.7

Day of the Month.	2d.	10th.	18th.	26th.	Day of the Month.	3d.	11th.	19th.	27th.
Semidiameter . . . . .	"	"	"	"	Semidiameter . . . . .	"	"	"	"
Horizontal Parallax . . . . .	7.60	7.68	7.76	7.86	Horizontal Parallax . . . . .	7.96	8.07	8.18	8.30
	0.86	0.86	0.87	0.89		0.90	0.91	0.92	0.93

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	23 53 54.95	+0.148	3 2 13.4	+0.22	17 17.5	1	23 52 48.37	-0.319	3 18 15.5	-2.73	15 14.4
2	23 53 58.32	0.133	3 2 9.2	0.12	17 13.7	2	23 52 40.53	0.333	3 19 22.0	2.82	15 10.4
3	23 54 1.32	0.118	3 2 7.4	+0.02	17 9.8	3	23 52 32.35	0.347	3 20 30.5	2.90	15 6.3
4	23 54 3.95	0.102	3 2 8.0	-0.08	17 5.9	4	23 52 23.85	0.361	3 21 40.9	2.98	15 2.2
5	23 54 6.22	0.086	3 2 10.9	0.18	17 2.0	5	23 52 15.03	0.374	3 22 53.3	3.06	14 58.2
6	23 54 8.11	+0.071	3 2 16.3	-0.28	16 58.1	6	23 52 5.90	-0.387	3 24 7.6	-3.14	14 54.1
7	23 54 9.63	0.056	3 2 24.1	0.38	16 54.2	7	23 51 56.43	0.400	3 25 23.8	3.22	14 50.0
8	23 54 10.78	0.040	3 2 34.3	0.48	16 50.3	8	23 51 46.66	0.413	3 26 41.8	3.30	14 45.9
9	23 54 11.54	0.024	3 2 47.0	0.58	16 46.3	9	23 51 36.58	0.426	3 28 1.6	3.37	14 41.8
10	23 54 11.94	+0.008	3 3 2.0	0.68	16 42.4	10	23 51 26.19	0.439	3 29 23.3	3.44	14 37.7
11	23 54 11.96	-0.007	3 3 19.4	-0.78	16 38.4	11	23 51 15.50	-0.451	3 30 46.7	-3.51	14 33.6
12	23 54 11.61	0.023	3 3 39.2	0.88	16 34.5	12	23 51 4.52	0.463	3 32 11.7	3.58	14 29.4
13	23 54 10.89	0.038	3 4 1.4	0.98	16 30.6	13	23 50 53.26	0.475	3 33 38.3	3.65	14 25.3
14	23 54 9.79	0.054	3 4 25.9	1.08	16 26.6	14	23 50 41.71	0.487	3 35 6.6	3.71	14 21.2
15	23 54 8.33	0.069	3 4 52.8	1.18	16 22.7	15	23 50 29.88	0.499	3 36 36.5	3.76	14 17.1
16	23 54 6.50	-0.084	3 5 22.1	-1.27	16 18.7	16	23 50 17.79	-0.510	3 38 7.9	-3.83	14 12.9
17	23 54 4.30	0.100	3 5 53.7	1.37	16 14.7	17	23 50 5.43	0.521	3 39 40.7	3.89	14 8.8
18	23 54 1.73	0.115	3 6 27.5	1.47	16 10.8	18	23 49 52.81	0.531	3 41 15.0	3.95	14 4.6
19	23 53 58.80	0.130	3 7 3.7	1.57	16 6.8	19	23 49 39.94	0.541	3 42 50.7	4.01	14 0.5
20	23 53 55.51	0.145	3 7 42.2	1.66	16 2.8	20	23 49 26.83	0.551	3 44 27.7	4.07	13 56.3
21	23 53 51.86	-0.160	3 8 23.0	-1.75	15 58.8	21	23 49 13.48	-0.561	3 46 5.9	-4.12	13 52.2
22	23 53 47.84	0.175	3 9 6.0	1.84	15 54.8	22	23 48 59.89	0.571	3 47 45.4	4.17	13 48.0
23	23 53 43.47	0.190	3 9 51.2	1.93	15 50.8	23	23 48 46.07	0.580	3 49 26.1	4.22	13 43.9
24	23 53 38.75	0.205	3 10 38.6	2.02	15 46.8	24	23 48 32.04	0.589	3 51 7.9	4.27	13 39.7
25	23 53 33.67	0.220	3 11 28.3	2.11	15 42.8	25	23 48 17.79	0.598	3 52 50.9	4.32	13 35.5
26	23 53 28.24	-0.234	3 12 20.1	-2.20	15 38.7	26	23 48 3.33	-0.606	3 54 35.0	-4.36	13 31.3
27	23 53 22.46	0.249	3 13 14.1	2.29	15 34.7	27	23 47 48.67	0.614	3 56 20.0	4.40	13 27.2
28	23 53 16.33	0.265	3 14 10.2	2.38	15 30.7	28	23 47 33.82	0.622	3 58 6.0	4.44	13 23.0
29	23 53 9.85	0.277	3 15 8.4	2.47	15 26.6	29	23 47 18.78	0.630	3 59 52.9	4.48	13 18.8
30	23 53 3.03	0.291	3 16 8.7	2.56	15 22.6	30	23 47 3.56	0.638	4 1 40.7	4.51	13 14.6
31	23 52 55.87	-0.305	3 17 11.1	-2.64	15 18.5	31	23 46 48.17	-0.645	4 3 29.2	-4.54	13 10.4
32	23 52 48.37	-0.319	3 18 15.5	-2.73	15 14.4	32	23 46 32.62	-0.652	4 5 18.5	-4.57	13 6.2

Day of the Month.	5th.	18th.	21st.	29th.	Day of the Month.	6th.	14th.	22d.	30th.
Semidiameter . . . . .	8.41	8.53	8.65	8.75	Semidiameter . . . . .	8.85	8.93	9.00	9.06
Horizontal Parallax . . . . .	0.95	0.96	0.97	0.98	Horizontal Parallax . . . . .	0.99	1.01	1.01	1.02

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.						
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.		
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m	
1	23 46 32.62	-0.652	4 5 18.5	-4.57	13 6.2	1	23 38 12.77	-0.681	5 0 52.1	-4.32	11 0.0	
2	23 46 16.91	0.658	4 7 8.5	4.60	13 2.0	2	23 37 56.48	0.677	5 2 35.3	4.28	10 55.8	
3	23 46 1.04	0.654	4 8 59.2	4.62	12 57.8	3	23 37 40.31	0.672	5 4 17.3	4.23	10 51.6	
4	23 45 45.03	0.670	4 10 50.4	4.64	12 53.6	4	23 37 24.27	0.666	5 5 58.2	4.18	10 47.4	
5	23 45 28.90	0.675	4 12 42.1	4.66	12 49.4	5	23 37 8.36	0.660	5 7 37.9	4.13	10 43.2	
6	23 45 12.65	-0.680	4 14 34.3	-4.68	12 45.2	6	23 36 52.61	-0.654	5 9 16.3	-4.07	10 39.0	
7	23 44 56.28	0.684	4 16 27.0	4.70	12 41.0	7	23 36 37.01	0.647	5 10 53.3	4.01	10 34.8	
8	23 44 39.80	0.688	4 18 20.0	4.71	12 36.8	8	23 36 21.57	0.640	5 12 28.9	3.95	10 30.6	
9	23 44 23.23	0.692	4 20 13.2	4.72	12 32.6	9	23 36 6.29	0.633	5 14 3.1	3.89	10 26.4	
10	23 44 6.57	0.695	4 22 6.6	4.72	12 28.4	10	23 35 51.20	0.625	5 15 35.8	3.83	10 22.3	
11	23 43 49.83	-0.698	4 24 0.2	-4.73	12 24.2	11	23 35 36.31	-0.617	5 17 6.9	-3.77	10 18.1	
12	23 43 33.02	0.701	4 25 53.9	4.73	12 20.0	12	23 35 21.62	0.608	5 18 36.4	3.70	10 13.9	
13	23 43 16.16	0.704	4 27 47.6	4.74	12 15.8	13	23 35 7.14	0.599	5 20 4.4	3.63	10 9.7	
14	23 42 59.25	0.706	4 29 41.3	4.74	12 11.6	14	23 34 52.87	0.590	5 21 30.7	3.56	10 5.6	
15	23 42 42.29	0.706	4 31 34.9	4.73	12 7.4	15	23 34 38.83	0.580	5 22 55.2	3.49	10 1.4	
16	23 42 25.30	-0.707	4 33 28.3	-4.72	12 3.1	16	23 34 25.01	-0.570	5 24 17.9	-3.41	9 57.3	
17	23 42 8.30	0.708	4 35 21.5	4.71	11 58.9	17	23 34 11.42	0.560	5 25 38.7	3.33	9 53.1	
18	23 41 51.29	0.708	4 37 14.4	4.70	11 54.7	18	23 33 58.07	0.550	5 26 57.7	3.25	9 49.0	
19	23 41 34.26	0.709	4 39 7.1	4.69	11 50.5	19	23 33 44.98	0.540	5 28 14.8	3.17	9 44.8	
20	23 41 17.24	0.709	4 40 59.3	4.67	11 46.3	20	23 33 32.15	0.529	5 29 30.0	3.09	9 40.7	
21	23 41 0.24	-0.708	4 42 51.0	-4.65	11 42.1	21	23 33 19.58	-0.518	5 30 43.3	-3.01	9 36.5	
22	23 40 43.26	0.707	4 44 42.3	4.63	11 37.9	22	23 33 7.27	0.507	5 31 54.5	2.93	9 32.4	
23	23 40 26.29	0.706	4 46 33.1	4.60	11 33.7	23	23 32 55.24	0.496	5 33 3.7	2.85	9 28.3	
24	23 40 9.36	0.704	4 48 23.2	4.57	11 29.5	24	23 32 43.49	0.484	5 34 10.8	2.76	9 24.1	
25	23 39 52.49	0.702	4 50 12.6	4.54	11 25.3	25	23 32 32.03	0.472	5 35 15.9	2.67	9 20.0	
26	23 39 35.68	-0.699	4 52 1.3	-4.51	11 21.0	26	23 32 20.86	-0.460	5 36 18.9	-2.58	9 15.9	
27	23 39 18.94	0.696	4 53 49.3	4.48	11 16.8	27	23 32 9.99	0.447	5 37 19.7	2.49	9 11.8	
28	23 39 2.26	0.693	4 55 36.4	4.44	11 12.6	28	23 31 59.42	0.434	5 38 18.3	2.40	9 7.7	
29	23 38 45.67	0.689	4 57 22.6	4.40	11 8.4	29	23 31 49.16	0.421	5 39 14.7	2.30	9 3.6	
30	23 38 29.17	0.685	4 59 7.8	4.36	11 4.2	30	23 31 39.22	0.408	5 40 8.9	2.21	8 59.5	
31	23 38 12.77	-0.681	5 0 52.1	-4.32	11 0.0	31	23 31 29.60	-0.394	5 41 0.7	-2.12	8 55.4	
32	23 37 56.48	-0.677	5 2 35.3	-4.28	10 55.8	32	23 31 20.31	-0.380	5 41 50.2	-2.02	8 51.3	
Day of the Month.					7th.	15th.	23d.	Day of the Month.				
					"	"	"					
Semidiameter . . . . .					9.10	9.12	9.11	Semidiameter . . . . .				
Horizontal Parallax . . . . .					1.02	1.03	1.03	Horizontal Parallax . . . . .				



## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.								
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.			
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.				
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m			
1	23 31 20.31	-0.380	-5 41 50.2	-2.02	8 51.3	1	23 29 31.62	+0.091	-5 47 20.3	+1.13	6 51.6			
2	23 31 11.34	0.366	5 42 37.4	1.92	8 47.2	2	23 29 34.00	0.107	5 46 51.7	1.23	6 47.7			
3	23 31 2.71	0.352	5 43 22.3	1.82	8 43.2	3	23 29 36.78	0.124	5 46 20.5	1.34	6 43.9			
4	23 30 54.43	0.338	5 44 4.8	1.72	8 39.1	4	23 29 39.96	0.141	5 45 46.6	1.45	6 40.0			
5	23 30 46.50	0.324	5 44 44.8	1.62	8 35.1	5	23 29 43.54	0.157	5 45 10.3	1.56	6 36.1			
6	23 30 38.92	-0.309	-5 45 22.4	-1.52	8 31.0	6	23 29 47.51	+0.174	-5 44 31.5	+1.67	6 32.3			
7	23 30 31.68	0.294	5 45 57.6	1.42	8 26.9	7	23 29 51.87	0.190	5 43 50.1	1.77	6 28.4			
8	23 30 24.81	0.279	5 46 30.3	1.31	8 22.9	8	23 29 56.63	0.207	5 43 6.2	1.88	6 24.5			
9	23 30 18.31	0.264	5 47 0.5	1.21	8 18.9	9	23 30 1.79	0.223	5 42 19.8	1.99	6 20.7			
10	23 30 12.18	0.249	5 47 28.2	1.10	8 14.8	10	23 30 7.33	0.239	5 41 30.9	2.09	6 16.8			
11	23 30 6.40	-0.233	-5 47 53.4	-1.00	8 10.8	11	23 30 13.26	+0.255	-5 40 39.5	+2.20	6 13.0			
12	23 30 1.00	0.217	5 48 16.0	0.89	8 6.8	12	23 30 19.58	0.271	5 39 45.7	2.30	6 9.2			
13	23 29 55.99	0.201	5 48 36.1	0.78	8 2.8	13	23 30 26.29	0.287	5 38 49.4	2.40	6 5.4			
14	23 29 51.36	0.186	5 48 53.7	0.68	7 58.8	14	23 30 33.38	0.303	5 37 50.7	2.50	6 1.6			
15	23 29 47.08	0.171	5 49 8.7	0.57	7 54.8	15	23 30 40.85	0.319	5 36 49.6	2.60	5 57.8			
16	23 29 43.19	-0.155	-5 49 21.2	-0.46	7 50.8	16	23 30 48.70	+0.335	-5 35 46.1	+2.70	5 54.0			
17	23 29 39.70	0.139	5 49 31.2	0.35	7 46.8	17	23 30 56.92	0.351	5 34 40.2	2.80	5 50.2			
18	23 29 36.60	0.122	5 49 38.6	0.24	7 42.8	18	23 31 5.52	0.366	5 33 32.0	2.89	5 46.4			
19	23 29 33.86	0.106	5 49 43.4	0.13	7 38.8	19	23 31 14.49	0.382	5 32 21.5	2.99	5 42.6			
20	23 29 31.51	0.090	5 49 45.6	-0.02	7 34.8	20	23 31 23.83	0.397	5 31 8.6	3.09	5 38.8			
21	23 29 29.55	-0.074	-5 49 45.2	+0.08	7 30.9	21	23 31 33.54	+0.412	-5 29 53.4	+3.19	5 35.0			
22	23 29 27.99	0.058	5 49 42.3	0.18	7 26.9	22	23 31 43.61	0.427	5 28 36.0	3.28	5 31.3			
23	23 29 26.82	0.041	5 49 36.8	0.28	7 23.0	23	23 31 54.04	0.442	5 27 16.3	3.37	5 27.5			
24	23 29 26.04	0.025	5 49 28.7	0.39	7 19.0	24	23 32 4.83	0.457	5 25 54.4	3.46	5 23.8			
25	23 29 25.66	-0.009	5 49 18.1	0.49	7 15.1	25	23 32 15.98	0.472	5 24 30.3	3.55	5 20.0			
26	23 29 25.66	+0.008	-5 49 4.9	+0.60	7 11.2	26	23 32 27.48	+0.487	-5 23 4.0	+3.64	5 16.3			
27	23 29 26.05	0.024	5 48 49.1	0.70	7 7.3	27	23 32 39.33	0.502	5 21 35.5	3.73	5 12.6			
28	23 29 26.84	0.041	5 48 30.7	0.80	7 3.3	28	23 32 51.53	0.516	5 20 4.7	3.82	5 8.8			
29	23 29 28.03	0.058	5 48 9.8	0.91	6 59.4	29	23 33 4.08	0.530	5 18 31.9	3.91	5 5.1			
30	23 29 29.63	0.074	5 47 46.3	1.02	6 55.5	30	23 33 16.97	0.545	5 16 56.9	4.00	5 1.4			
31	23 29 31.62	+0.091	-5 47 20.3	+1.13	6 51.6	31	23 33 30.21	+0.559	-5 15 19.8	+4.09	4 57.7			
32	23 29 34.00	+0.107	-5 46 51.7	+1.23	6 47.7	32	23 33 43.79	+0.573	-5 13 40.6	+4.18	4 54.0			
Day of the Month.						Day of the Month.								
			2d.	10th.	14th.	26th.				4th.	12th.	20th.	28th.	36th.
			"	"	"	"				"	"	"	"	"
Semidiameter			8.81	8.71	8.61	8.49	Semidiameter			8.37	8.26	8.15	8.04	7.93
Horizontal Parallax			0.99	0.98	0.97	0.96	Hor. Parallax			0.94	0.93	0.92	0.90	0.89

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.			Var. of R. A. for 1 Day.	Apparent Declination.			Var. of Decl. for 1 Day.	Meridian Passage.		Month and Day.	Apparent Right Ascension.			Var. of R. A. for 1 Day.	Apparent Declination.			Var. of Decl. for 1 Day.	Meridian Passage.	
	h m s	s	"		h m s	s	"					h m s	s	"							
Jan. 2	18	38	10.15	+15.642	-23	28	19.3	+13.71	23	50.6	July 1	18	47	12.33	-10.529	-23	22	45.4	-12.41	12	11.6
6	18	39	12.62	15.585	23	27	23.9	13.96	23	35.9	5	18	46	30.16	10.543	23	23	34.6	12.15	11	55.1
10	18	40	14.76	15.475	23	26	27.6	14.16	23	21.2	9	18	45	48.08	10.486	23	24	22.6	11.84	11	38.7
14	18	41	16.35	15.311	23	25	30.6	14.32	23	6.5	13	18	45	6.37	10.356	23	25	9.3	11.45	11	22.3
18	18	42	17.17	15.088	23	24	33.0	14.41	22	51.8	17	18	44	25.33	10.153	23	25	54.2	10.99	11	5.9
22	18	43	16.99	+14.815	-23	23	35.3	+14.42	22	37.0	21	18	43	45.23	-9.885	-23	26	37.2	-10.46	10	49.5
26	18	44	15.63	14.496	23	22	37.6	14.37	22	22.3	25	18	43	6.33	9.555	23	27	17.9	9.89	10	33.1
30	18	45	12.90	14.130	23	21	40.3	14.25	22	7.5	29	18	42	28.87	9.166	23	27	56.3	9.27	10	16.8
Feb. 3	18	46	8.60	13.715	23	20	43.6	14.05	21	52.7	Aug. 2	18	41	53.08	8.719	23	28	32.1	8.62	10	0.4
7	18	47	2.56	13.257	23	19	47.9	13.75	21	37.9	6	18	41	19.20	8.208	23	29	5.2	7.95	9	44.2
11	18	47	54.59	+12.748	-23	18	53.6	+13.39	21	23.0	10	18	40	47.49	-7.640	-23	29	35.7	-7.23	9	27.9
15	18	48	44.48	12.190	23	18	0.8	12.95	21	8.1	14	18	40	18.15	7.020	23	30	3.0	6.46	9	11.7
19	18	49	32.05	11.590	23	17	10.0	12.41	20	53.1	18	18	39	51.39	6.354	23	30	27.4	5.71	8	55.5
23	18	50	17.15	10.955	23	16	21.5	11.81	20	38.1	22	18	39	27.37	5.650	23	30	48.7	4.94	8	39.4
27	18	50	59.64	10.284	23	15	35.5	11.15	20	23.1	26	18	39	6.24	4.909	23	31	6.8	4.14	8	23.3
Mar. 3	18	51	39.38	+9.582	-23	14	52.3	+10.41	20	8.0	30	18	38	48.14	-4.135	-23	31	21.8	-3.32	8	7.3
7	18	52	16.25	8.846	23	14	12.2	9.59	19	52.9	Sept. 3	18	38	33.20	3.329	23	31	33.4	2.51	7	51.4
11	18	52	50.10	8.075	23	13	35.6	8.69	19	37.7	7	18	38	21.55	2.491	23	31	41.9	1.71	7	35.4
15	18	53	20.81	7.274	23	13	2.7	7.74	19	22.5	11	18	38	13.30	1.631	23	31	47.1	0.89	7	19.6
19	18	53	48.26	6.448	23	12	33.7	6.75	19	7.2	15	18	38	8.52	-0.757	23	31	49.0	-0.06	7	3.8
23	18	54	12.37	+5.606	-23	12	8.7	+5.71	18	51.9	19	18	38	7.25	+0.123	-23	31	47.6	+0.74	6	48.0
27	18	54	33.09	4.751	23	11	48.0	4.61	18	36.5	23	18	38	9.51	1.008	23	31	43.1	1.56	6	32.3
31	18	54	50.36	3.882	23	11	31.8	3.50	18	21.0	27	18	38	15.32	1.897	23	31	35.2	2.39	6	16.7
Apr. 4	18	55	4.13	3.003	23	11	20.0	2.36	18	5.5	Oct. 1	18	38	24.69	2.787	23	31	24.0	3.21	6	1.1
8	18	55	14.37	2.115	23	11	12.9	1.19	17	49.9	5	18	38	37.61	3.673	23	31	9.5	4.04	5	45.6
12	18	55	21.04	+1.220	-23	11	10.5	+0.02	17	34.3	9	18	38	54.07	+4.555	-23	30	51.7	+4.87	5	30.2
16	18	55	24.13	+0.326	23	11	12.7	-1.14	17	18.6	13	18	39	14.03	5.421	23	30	30.5	5.71	5	14.8
20	18	55	23.66	-0.556	23	11	19.6	2.29	17	2.9	17	18	39	37.41	6.265	23	30	6.0	6.54	4	59.5
24	18	55	19.70	1.424	23	11	31.0	3.41	16	47.1	21	18	40	4.12	7.087	23	29	38.2	7.37	4	44.2
28	18	55	12.29	2.278	23	11	46.9	4.52	16	31.2	25	18	40	34.07	7.883	23	29	7.0	8.19	4	29.0
May 2	18	55	1.50	-3.111	-23	12	7.2	-5.59	16	15.3	29	18	41	7.15	+8.656	-23	28	32.7	+9.01	4	13.8
6	18	54	47.43	3.924	23	12	31.6	6.60	15	59.3	Nov. 2	18	41	43.28	9.404	23	27	55.0	9.85	3	58.7
10	18	54	30.14	4.715	23	13	0.0	7.54	15	43.3	6	18	42	22.34	10.120	23	27	13.9	10.67	3	43.6
14	18	54	9.76	5.470	23	13	32.0	8.42	15	27.2	10	18	43	4.19	10.798	23	26	29.6	11.50	3	28.6
18	18	53	46.44	6.184	23	14	7.4	9.25	15	11.1	14	18	43	48.67	11.433	23	25	41.9	12.30	3	13.6
22	18	53	20.35	-6.852	-23	14	46.0	-9.99	14	55.0	18	18	44	35.60	+12.027	-23	24	51.2	+13.10	2	58.6
26	18	52	51.68	7.474	23	15	27.3	10.65	14	38.7	22	18	45	24.83	12.581	23	23	57.2	13.89	2	43.7
30	18	52	20.62	8.051	23	16	11.2	11.22	14	22.5	26	18	46	16.19	13.093	23	23	0.1	14.64	2	28.8
June 3	18	51	47.34	8.579	23	16	57.1	11.69	14	6.2	30	18	47	9.52	13.564	23	22	0.1	15.37	2	14.0
7	18	51	12.06	9.051	23	17	44.7	12.07	13	49.9	Dec. 4	18	48	4.64	13.989	23	20	57.2	16.09	1	59.1
11	18	50	35.01	-9.463	-23	18	33.7	-12.36	13	33.6	8	18	49	1.36	+14.360	-23	19	51.4	+16.76	1	44.4
15	18	49	56.44	9.810	23	19	23.6	12.54	13	17.2	12	18	49	59.45	14.677	23	18	43.1	17.41	1	29.6
19	18	49	16.62	10.088	23	20	14.0	12.61	13	0.8	16	18	50	58.71	14.944	23	17	32.1	18.03	1	14.9
23	18	48	35.82	10.301	23	21	4.7	12.66	12	44.4	20	18	51	58.94	15.164	23	16	18.8	18.57	1	0.1
27	18	47	54.30	10.447	23	21	55.3	12.59	12	28.0	24	18	52	59.95	15.331	23	15	3.5	19.06	0	45.4
July 1	18	47	12.33	-10.529	-23	22	45.4	-12.41	12	11.6	28	18	54	1.52	+15.450	-23	13	46.3	+19.52	0	30.7
5	18	46	30.16	-10.543	-23	23	34.6	-12.15	11	55.1	32	18	55	3.48	+15.518	-23	12	27.3	+19.92	0	16.0

Greatest semidiameter,  
Least semidiameter,

July 2, 1".82  
December 36, 1".64

Greatest horizontal parallax,  
Least horizontal parallax,

July 2, 0".48  
December 36, 0".43

[Eph 07]

## GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.			Var. of R. A. for 1 Day.	Apparent Declination.			Var. of Decl. for 1 Day.	Meridian Passage.	Month and Day.	Apparent Right Ascension.			Var. of R. A. for 1 Day.	Apparent Declination.			Var. of Decl. for 1 Day.	Meridian Passage.		
	Noon.				Noon.						Noon.				Noon.						
	h	m	s	s	°	'	"	"	h	m		h	m	s	s	°	'	"	"	h	m
Jan. 2	6	48	38.52	-7.302	+22	4	10.7	+9.14	12	2.7	July 1	6	52	44.95	+9.580	+22	4	26.2	-11.45	0	19.1
6	6	48	9.35	7.286	22	4	47.3	9.16	11	46.6	5	6	53	23.32	9.599	22	3	39.8	11.71	0	4.0
10	6	47	40.31	7.223	22	5	24.0	9.16	11	30.4	9	6	54	1.70	9.585	22	2	52.5	11.93	23	45.2
14	6	47	11.63	7.108	22	6	0.6	9.10	11	14.2	13	6	54	39.95	9.534	22	2	4.4	12.12	23	30.1
18	6	46	43.51	6.947	22	6	36.8	8.97	10	58.0	17	6	55	17.93	9.450	22	1	15.6	12.25	23	15.0
22	6	46	16.12	-6.740	+22	7	12.4	+8.80	10	41.8	21	6	55	55.51	+9.335	+22	0	26.4	-12.34	22	59.9
26	6	45	49.65	6.484	22	7	47.2	8.57	10	25.6	25	6	56	32.57	9.190	21	59	36.9	12.39	22	44.8
30	6	45	24.29	6.191	22	8	21.0	8.30	10	9.4	29	6	57	8.99	9.015	21	58	47.3	12.37	22	29.6
Feb. 3	6	45	0.17	5.864	22	8	53.6	8.00	9	53.3	Aug. 2	6	57	44.65	8.870	21	57	57.9	12.30	22	14.5
7	6	44	37.43	5.496	22	9	25.0	7.67	9	37.2	6	6	58	19.43	8.574	21	57	8.9	12.19	21	59.3
11	6	44	16.25	-5.092	+22	9	54.9	+7.29	9	21.1	10	6	58	53.20	+8.305	+21	56	20.4	-12.02	21	44.2
15	6	43	56.74	4.654	22	10	23.3	6.88	9	5.1	14	6	59	25.83	8.006	21	55	32.7	11.80	21	29.0
19	6	43	39.06	4.184	22	10	49.9	6.44	8	49.1	18	6	59	57.21	7.678	21	54	46.0	11.51	21	13.8
23	6	43	23.30	3.690	22	11	14.8	5.97	8	33.1	22	7	0	27.22	7.324	21	54	0.6	11.17	20	58.5
27	6	43	9.57	3.176	22	11	37.7	5.49	8	17.1	26	7	0	55.78	6.950	21	53	16.6	10.77	20	43.3
Mar. 3	6	42	57.92	-2.642	+22	11	58.7	+4.97	8	1.2	30	7	1	22.78	+6.546	+21	52	34.4	-10.32	20	28.0
7	6	42	48.45	2.092	22	12	17.5	4.44	7	45.3	Sept. 3	7	1	48.11	6.115	21	51	54.0	9.84	20	12.7
11	6	42	41.20	1.527	22	12	34.2	3.89	7	29.5	7	7	2	11.67	5.662	21	51	15.7	9.29	19	57.3
15	6	42	36.21	0.952	22	12	48.6	3.32	7	13.7	11	7	2	33.37	5.185	21	50	39.7	8.67	19	42.0
19	6	42	33.55	-0.370	22	13	0.8	2.76	6	57.9	15	7	2	53.12	4.688	21	50	6.3	8.01	19	26.5
23	6	42	33.24	+0.215	+22	13	10.7	+2.17	6	42.1	19	7	3	10.85	+4.175	+21	49	35.6	-7.32	19	11.1
27	6	42	35.27	0.799	22	13	18.2	1.57	6	26.4	23	7	3	26.50	3.649	21	49	7.7	6.59	18	55.6
31	6	42	39.63	1.379	22	13	23.3	0.96	6	10.8	27	7	3	40.02	3.107	21	48	42.9	5.80	18	40.1
Apr. 4	6	42	46.30	1.956	22	13	25.9	+0.34	5	55.2	Oct. 1	7	3	51.34	2.551	21	48	21.3	5.00	18	24.6
8	6	42	55.27	2.525	22	13	26.0	-0.27	5	39.6	5	7	4	0.41	1.981	21	48	3.0	4.15	18	9.0
12	6	43	6.49	+3.086	+22	13	23.7	-0.90	5	24.1	9	7	4	7.18	+1.404	+21	47	48.1	-3.29	17	53.3
16	6	43	19.96	3.639	22	13	18.8	1.52	5	8.6	13	7	4	11.64	0.824	21	47	36.7	2.40	17	37.7
20	6	43	35.58	4.170	22	13	11.5	2.15	4	53.1	17	7	4	13.77	+0.242	21	47	28.9	1.46	17	22.0
24	6	43	53.30	4.684	22	13	1.6	2.77	4	37.7	21	7	4	13.58	-0.335	21	47	24.8	-0.55	17	6.3
28	6	44	13.03	5.179	22	12	49.3	3.39	4	22.3	25	7	4	11.09	0.911	21	47	24.3	+0.34	16	50.5
May 2	6	44	34.71	+5.657	+22	12	34.5	-4.01	4	6.9	29	7	4	6.30	-1.483	+21	47	27.4	+1.24	16	34.7
6	6	44	58.26	6.114	22	12	17.2	4.64	3	51.6	Nov. 2	7	3	59.24	2.045	21	47	34.2	2.14	16	18.8
10	6	45	23.59	6.547	22	11	57.5	5.24	3	36.3	6	7	3	49.95	2.596	21	47	44.5	3.02	16	2.9
14	6	45	50.60	6.956	22	11	35.3	5.83	3	21.0	10	7	3	38.48	3.132	21	47	58.4	3.88	15	47.0
18	6	46	19.20	7.337	22	11	10.8	6.41	3	5.7	14	7	3	24.92	3.645	21	48	15.6	4.71	15	31.0
22	6	46	49.26	+7.688	+22	10	44.0	-6.99	2	50.5	18	7	3	9.35	-4.132	+21	48	36.1	+5.51	15	15.0
26	6	47	20.67	8.012	22	10	14.9	7.54	2	35.3	22	7	2	51.88	4.598	21	48	59.7	6.27	14	59.0
30	6	47	53.32	8.308	22	9	43.7	8.07	2	20.1	26	7	2	32.60	5.036	21	49	26.3	6.99	14	43.0
June 3	6	48	27.10	8.576	22	9	10.4	8.59	2	5.0	30	7	2	11.63	5.445	21	49	55.6	7.65	14	26.9
7	6	49	1.89	8.817	22	8	35.0	9.09	1	49.8	Dec. 4	7	1	49.09	5.817	21	50	27.5	8.26	14	10.8
11	6	49	37.59	+9.026	+22	7	57.7	-9.55	1	34.7	8	7	1	25.14	-6.153	+21	51	1.7	+8.80	13	54.7
15	6	50	14.05	9.199	22	7	18.6	10.00	1	19.5	12	7	0	59.92	6.447	21	51	37.9	9.29	13	38.5
19	6	50	51.14	9.341	22	6	37.7	10.41	1	4.4	16	7	0	33.52	6.696	21	52	16.0	9.72	13	22.4
23	6	51	28.74	9.453	22	5	55.3	10.79	0	49.3	20	7	0	6.41	6.903	21	52	55.7	10.07	13	6.2
27	6	52	6.72	9.531	22	5	11.4	11.14	0	34.2	24	6	59	38.45	7.070	21	53	36.6	10.36	12	50.0
July 1	6	52	44.95	+9.580	+22	4	26.2	-11.45	0	19.1	28	6	59	9.91	-7.191	+21	54	18.6	+10.59	12	33.8
5	6	53	23.32	+9.599	+22	3	39.8	-11.71	0	4.0	32	6	58	40.99	-7.266	+21	55	1.3	+10.76	12	17.6

Least semidiameter,  
Greatest semidiameter,

July 5, 1".24  
December 35, 1".33

Least horizontal parallax,  
Greatest horizontal parallax,

July 5, 0".29  
December 35, 0".3:

[Eph 07]

MERCURY.											
GREENWICH MEAN NOON.											
Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
	°	'	"						At Date.	At Intermediate Date.	
Jan. 0	215	37	42.3	3 5 8.9	- 5 5.3	+ 1 24 53.9	- 22 15.9	9.642 9428	0.094 8979	0.097 2858	
1	218	41	17.0	3 2 3.5	3 47.7	1 2 42.5	22 6.5	9.646 5341	0.099 6080	0.101 8661	
2	221	41	55.2	2 59 15.6	2 28.7	0 40 41.6	21 54.9	9.649 8566	0.104 0614	0.106 1952	
3	224	39	53.8	2 56 44.3	- 1 9.3	+ 0 18 53.4	21 41.2	9.652 9106	0.108 2687	0.110 2831	
4	227	35	29.1	2 54 28.8	+ 0 9.8	- 0 2 40.3	21 25.8	9.655 6969	0.112 2395	0.114 1392	
5	230	28	56.5	2 52 28.5	+ 1 27.8	- 0 23 57.9	- 21 9.0	9.658 2162	0.115 9832	0.117 7724	
6	233	20	31.0	2 50 42.9	2 44.1	0 44 57.9	20 50.8	9.660 4697	0.119 5079	0.121 1907	
7	236	10	27.1	2 49 11.5	3 58.1	1 5 39.1	20 31.4	9.662 4582	0.122 8216	0.124 4015	
8	238	58	58.7	2 47 53.8	5 9.1	1 26 0.3	20 10.8	9.664 1827	0.125 9313	0.127 4119	
9	241	46	19.3	2 46 49.5	6 16.6	1 46 0.3	19 49.0	9.665 6444	0.128 8438	0.130 2279	
10	244	32	42.1	2 45 58.2	+ 7 20.2	- 2 5 38.0	- 19 26.2	9.666 8438	0.131 5646	0.132 8547	
11	247	18	20.0	2 45 19.7	8 19.4	2 24 52.4	19 2.4	9.667 7816	0.134 0989	0.135 2979	
12	250	3	25.7	2 44 53.7	9 13.7	2 43 42.5	18 37.6	9.668 4586	0.136 4521	0.137 5619	
13	252	48	11.5	2 44 40.0	10 2.8	3 2 7.2	18 11.6	9.668 8754	0.138 6279	0.139 6505	
14	255	32	49.8	2 44 38.6	10 46.3	3 20 5.4	17 44.6	9.669 0321	0.140 6302	0.141 5674	
15	258	17	32.9	2 44 49.5	+ 11 23.9	- 3 37 36.0	- 17 16.4	9.668 9288	0.142 4624	0.143 3155	
16	261	2	32.9	2 45 12.5	11 55.2	3 54 37.8	16 46.9	9.668 5654	0.144 1269	0.144 8970	
17	263	48	2.0	2 45 47.8	12 19.9	4 11 9.5	16 16.1	9.667 9418	0.145 6261	0.146 3143	
18	266	34	12.6	2 46 35.4	12 37.8	4 27 9.6	15 43.8	9.667 0574	0.146 9618	0.147 5686	
19	269	21	17.0	2 47 35.5	12 48.7	4 42 36.6	15 10.0	9.665 9118	0.148 1349	0.148 6609	
20	272	9	27.9	2 48 48.4	+ 12 52.3	- 4 57 28.9	- 14 34.3	9.664 5041	0.149 1464	0.149 5914	
21	274	58	58.1	2 50 14.1	12 48.4	5 11 44.5	13 56.6	9.662 8336	0.149 9959	0.150 3601	
22	277	50	0.6	2 51 53.1	12 37.0	5 25 21.4	13 16.8	9.660 8993	0.150 6837	0.150 9665	
23	280	42	48.8	2 53 45.6	12 17.9	5 38 17.4	12 34.7	9.658 7002	0.151 2084	0.151 4092	
24	283	37	36.5	2 55 52.1	11 50.9	5 50 30.0	11 49.9	9.656 2353	0.151 5685	0.151 6860	
25	286	34	37.9	2 58 13.1	+ 11 16.2	- 6 1 56.3	- 11 2.2	9.653 5039	0.151 7615	0.151 7947	
26	289	34	7.8	3 0 49.1	10 33.7	6 12 33.4	10 11.4	9.650 5048	0.151 7851	0.151 7321	
27	292	36	21.2	3 3 40.4	9 43.6	6 22 18.0	9 17.1	9.647 2375	0.151 6353	0.151 4942	
28	295	41	33.9	3 6 47.7	8 46.0	6 31 6.3	8 18.9	9.643 7014	0.151 3081	0.151 0763	
29	298	50	2.3	3 10 11.9	7 41.1	6 38 54.4	7 16.5	9.639 8965	0.150 7982	0.150 4732	
30	302	2	3.5	3 13 53.3	+ 6 29.4	- 6 45 37.7	- 6 9.4	9.635 8233	0.150 1004	0.149 6788	
31	305	17	55.0	3 17 52.7	5 11.3	6 51 11.4	4 57.2	9.631 4827	0.149 2075	0.148 6857	
Feb. 1	308	37	55.3	3 22 11.0	3 47.5	6 55 30.3	3 39.5	9.626 8767	0.148 1122	0.147 4859	
2	312	2	23.5	3 26 48.6	2 18.6	6 58 28.5	2 15.8	9.622 0084	0.146 8057	0.146 0704	
3	315	31	39.3	3 31 46.4	+ 0 45.7	6 59 59.8	- 0 45.6	9.616 8817	0.145 2787	0.144 4292	
4	319	6	3.3	3 37 5.1	- 0 50.2	- 6 59 57.5	+ 0 51.5	9.611 5027	0.143 5203	0.142 5508	
5	322	45	56.6	3 42 45.1	2 27.8	6 58 14.4	2 36.0	9.605 8790	0.141 5189	0.140 4229	
6	326	31	40.9	3 48 47.2	4 5.4	6 54 42.8	4 28.5	9.600 0206	0.139 2610	0.138 0316	
7	330	23	38.5	3 55 11.7	5 41.3	6 49 14.7	6 29.2	9.593 9401	0.136 7326	0.135 3620	
8	334	22	11.8	4 1 58.6	7 13.6	6 41 41.6	8 38.4	9.587 6537	0.133 9177	0.132 3976	
9	338	27	43.2	4 9 8.0	- 8 40.0	- 6 31 54.9	+ 10 56.4	9.581 1807	0.130 7992	0.129 1206	
10	342	40	35.2	4 16 39.5	9 57.8	6 19 46.0	13 22.8	9.574 5452	0.127 3589	0.125 5118	
11	347	1	9.5	4 24 32.4	11 4.7	6 5 6.4	15 57.6	9.567 7765	0.123 5767	0.121 5507	
12	351	29	46.7	4 32 45.3	11 57.7	5 47 48.0	18 40.3	9.560 9083	0.119 4313	0.117 2156	
13	356	6	46.0	4 41 16.3	12 34.1	5 27 43.6	21 29.6	9.553 9814	0.114 9006	0.112 4835	
14	0	52	24.4	4 50 2.8	- 12 51.3	- 5 4 47.2	+ 24 23.9	9.547 0430	0.109 9611	0.107 3304	
15	5	46	55.6	4 59 1.3	- 12 46.7	- 4 38 54.9	+ 27 21.0	9.540 1474	0.104 5885	0.101 7322	

## MERCURY.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Interme- diate Date.
Feb. 15	5 46 55.6	4 59 1.3	- 12 46.7	- 4 38 54.9	+ 27 21.0	9.540 1474	0.104 5885	0.101 7322
16	10 50 29.4	5 8 7.3	12 18.5	4 10 5.1	30 18.5	9.533 3561	0.098 7585	0.095 6643
17	16 3 10.9	5 17 15.4	11 25.3	3 38 19.1	33 12.5	9.526 7383	0.092 4467	0.089 1024
18	21 24 58.8	5 26 18.9	10 6.9	2 3 42.6	35 58.8	9.520 3695	0.085 6289	0.082 0233
19	26 55 44.6	5 35 10.0	8 24.0	2 26 25.6	38 32.7	9.514 3307	0.078 2832	0.074 4062
20	32 35 11.8	5 43 39.9	- 6 19.0	- 1 46 43.3	+ 40 48.7	9.508 7077	0.070 3900	0.066 2324
21	38 22 54.4	5 51 39.1	3 55.6	1 4 57.1	42 39.9	9.503 5883	0.061 9320	0.057 4875
22	44 18 16.3	5 58 56.9	- 1 19.0	- 0 21 33.4	44 1.9	9.499 0598	0.052 8980	0.048 1630
23	50 20 30.9	6 5 22.7	+ 1 24.0	+ 0 22 55.1	44 48.8	9.495 2054	0.043 2822	0.038 2561
24	56 28 40.9	6 10 46.0	4 5.8	1 7 51.1	44 56.1	9.492 1006	0.033 0857	0.027 7724
25	62 41 39.0	6 14 57.3	+ 6 38.2	+ 1 52 33.1	+ 44 20.5	9.489 8097	0.022 3183	0.016 7262
26	68 58 8.8	6 17 48.2	8 52.8	2 36 17.6	43 1.1	9.488 3822	0.010 9996	0.005 1425
27	75 16 46.7	6 19 12.6	10 42.3	3 18 21.0	40 58.4	9.487 8497	9.999 1596	9.993 0563
28	81 36 4.0	6 19 6.7	12 0.7	3 58 1.0	38 15.1	9.488 2244	9.986 8390	9.980 5147
Mar. 1	87 54 30.0	6 17 29.9	12 43.9	4 34 39.6	34 56.6	9.489 4975	9.974 0911	9.967 5767
2	94 10 34.2	6 14 24.1	+ 12 50.3	+ 5 7 44.5	+ 31 9.0	9.491 6410	9.960 9807	9.954 3129
3	100 22 50.2	6 9 54.5	12 20.5	5 36 50.0	26 59.3	9.494 6081	9.947 5839	9.940 8049
4	106 29 57.8	6 4 8.7	11 17.2	6 1 38.7	22 36.4	9.498 3371	9.933 9880	9.927 1459
5	112 30 45.5	5 57 16.5	9 45.2	6 22 0.8	18 7.6	9.502 7538	9.920 2917	9.913 4391
6	118 24 12.0	5 49 28.3	7 50.4	6 37 54.3	13 40.2	9.507 7764	9.906 6025	9.899 7965
7	124 9 27.4	5 40 56.1	+ 5 39.2	+ 6 49 23.7	+ 9 20.3	9.513 3179	9.893 0364	9.886 3377
8	129 45 53.4	5 31 51.3	3 18.3	6 56 39.1	5 13.1	9.519 2906	9.879 7163	9.873 1883
9	135 13 2.9	5 22 24.9	+ 0 54.0	6 59 55.4	+ 1 22.4	9.525 6080	9.866 7701	9.860 4783
10	140 30 39.4	5 12 46.9	- 1 27.9	6 59 30.0	- 2 9.9	9.532 1882	9.854 3291	9.848 3388
11	145 38 35.8	5 3 6.2	3 42.7	6 55 42.2	5 22.0	9.538 9544	9.842 5233	9.836 8985
12	150 36 53.5	4 53 30.5	- 5 46.6	+ 6 48 52.7	- 8 13.6	9.545 8363	9.831 4797	9.826 2820
13	155 25 40.6	4 44 5.8	7 36.8	6 39 21.8	10 45.0	9.552 7711	9.821 3194	9.816 6052
14	160 5 10.6	4 34 57.1	9 11.3	6 27 29.1	12 57.1	9.559 7035	9.812 1518	9.807 9704
15	164 35 41.5	4 26 8.2	10 29.1	6 13 33.5	14 50.9	9.566 5853	9.804 0714	9.800 4637
16	168 57 34.5	4 17 41.7	11 29.7	5 57 52.6	16 28.0	9.573 3740	9.797 1550	9.794 1515
17	173 11 12.9	4 9 39.3	- 12 13.2	+ 5 40 42.5	- 17 49.8	9.580 0349	9.791 4578	9.789 0773
18	177 17 1.5	4 2 2.3	12 40.3	5 22 17.6	18 57.6	9.586 5379	9.787 0115	9.785 2608
19	181 15 26.0	3 54 51.2	12 51.7	5 2 50.9	19 53.6	9.592 8583	9.783 8241	9.782 6988
20	185 6 52.4	3 48 5.9	12 48.7	4 42 34.0	20 38.6	9.598 9757	9.781 8806	9.781 3642
21	188 51 46.4	3 41 46.3	12 32.3	4 21 36.9	21 14.1	9.604 8738	9.781 1428	9.781 2086
22	192 30 33.4	3 35 51.8	- 12 4.0	+ 4 0 8.5	- 21 41.3	9.610 5393	9.781 5532	9.782 1671
23	196 3 38.2	3 30 21.7	11 25.2	3 38 16.7	22 1.3	9.615 9617	9.783 0402	9.784 1615
24	199 31 24.6	3 25 15.1	10 37.2	3 16 8.1	22 15.0	9.621 1327	9.785 5197	9.787 1034
25	202 54 15.9	3 20 31.2	9 41.2	2 53 48.6	22 23.3	9.626 0465	9.788 9004	9.790 8987
26	206 12 34.2	3 16 8.9	8 38.6	2 31 23.3	22 26.9	9.630 6986	9.793 0863	9.795 4513
27	209 26 40.6	3 12 7.3	- 7 30.6	+ 2 8 56.4	- 22 26.4	9.635 0856	9.797 9818	9.800 6660
28	212 36 55.4	3 8 25.6	6 18.3	1 46 31.6	22 22.5	9.639 2054	9.803 4927	9.806 4510
29	215 43 38.2	3 5 2.9	5 2.8	1 24 12.3	22 15.6	9.643 0571	9.809 5305	9.812 7209
30	218 47 7.3	3 1 58.2	3 45.2	1 2 1.2	22 6.2	9.646 6400	9.816 0124	9.819 3951
31	221 47 40.4	2 59 10.8	2 26.3	0 40 0.7	21 54.5	9.649 9542	9.822 8603	9.826 3994
Apr. 1	224 45 34.4	2 56 39.9	- 1 6.8	+ 0 18 12.9	- 21 40.8	9.652 9999	9.830 0048	9.833 6690
2	227 41 5.5	2 54 24.8	+ 0 12.3	- 0 3 20.3	- 21 25.4	9.655 7780	9.837 3851	9.841 1468

MERCURY.									
GREENWICH MEAN NOON.									
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
							At Date.	At Intermediate Date.	
Apr. 1	224 45 34.4	2 56 39.9	— 1 6.8	+ 0 18 12.9	— 21 40.8	9.652 9999	9.830 0048	9.833 6690	
	2 227 41 5.5	2 54 24.8	+ 0 12.3	— 0 3 20.3	21 25.4	9.655 7780	9.837 3851	9.841 1468	
	3 230 34 29.2	2 52 25.0	1 30.2	0 24 37.4	21 8.5	9.658 2890	9.844 9477	9.848 7816	
	4 233 26 0.5	2 50 39.9	2 46.5	0 45 36.9	20 50.2	9.660 5342	9.852 6434	9.856 5282	
	5 236 15 53.8	2 49 9.0	4 0.3	1 6 17.5	20 30.7	9.662 5145	9.860 4314	9.864 3488	
	6 239 4 23.1	2 47 51.8	+ 5 11.2	— 1 26 38.0	— 20 10.0	9.664 2310	9.868 2765	9.872 2108	
	7 241 51 41.8	2 46 47.8	6 18.7	1 46 37.3	19 48.3	9.665 6843	9.876 1485	9.880 0866	
	8 244 38 3.1	2 45 56.9	7 22.2	2 6 14.3	19 25.5	9.666 8757	9.884 0223	9.887 9534	
	9 247 23 39.9	2 45 18.7	8 21.2	2 25 28.0	19 1.7	9.667 8055	9.891 8773	9.895 7919	
	10 250 8 44.8	2 44 53.1	9 15.4	2 44 17.3	18 36.8	9.668 4747	9.899 6952	9.903 5857	
	11 252 53 30.3	2 44 39.8	+ 10 4.3	— 3 2 41.2	— 18 10.8	9.668 8834	9.907 4619	9.911 3224	
	12 255 38 8.6	2 44 38.9	10 47.6	3 20 38.6	17 43.8	9.669 0321	9.915 1661	9.918 9916	
	13 258 22 52.1	2 44 50.1	11 24.9	3 38 8.4	17 15.5	9.668 9207	9.922 7981	9.926 5847	
	14 261 7 52.9	2 45 13.5	11 56.1	3 55 9.3	16 46.0	9.668 5494	9.930 3506	9.934 0949	
	15 263 53 23.2	2 45 49.1	12 20.6	4 11 40.0	16 15.2	9.667 9176	9.937 8172	9.941 5172	
	16 266 39 35.3	2 46 37.2	+ 12 38.3	— 4 27 39.1	— 15 42.8	9.667 0253	9.945 1939	9.948 8471	
	17 269 26 41.7	2 47 37.7	12 48.9	4 43 5.1	15 8.8	9.665 8714	9.952 4766	9.956 0820	
	18 272 14 54.9	2 48 50.9	12 52.3	4 57 56.2	14 33.1	9.664 4558	9.959 6631	9.963 2196	
	19 275 4 27.7	2 50 17.0	12 48.2	5 12 10.7	13 55.4	9.662 7773	9.966 7511	9.970 2577	
	20 277 55 33.3	2 51 56.4	12 36.5	5 25 46.4	13 15.5	9.660 8350	9.973 7391	9.977 1952	
	21 280 48 25.1	2 53 49.5	+ 12 17.1	— 5 38 41.0	— 12 33.3	9.658 6277	9.980 6258	9.984 0309	
	22 283 43 16.9	2 55 56.4	11 49.9	5 50 52.1	11 48.5	9.656 1548	9.987 4104	9.990 7639	
	23 286 40 22.7	2 58 17.7	11 15.0	6 2 17.0	11 0.7	9.653 4152	9.994 0915	9.997 3933	
	24 289 39 57.4	3 0 54.1	10 32.3	6 12 52.5	10 9.7	9.650 4081	0.000 6690	0.003 9183	
	25 292 42 16.1	3 3 45.9	9 41.9	6 22 35.4	9 15.3	9.647 1325	0.007 1411	0.010 3375	
	26 295 47 34.7	3 6 53.9	+ 8 44.0	— 6 31 21.9	— 8 17.0	9.643 5881	0.013 5071	0.016 6498	
	27 298 56 9.5	3 10 18.5	7 39.0	6 39 8.0	7 14.4	9.639 7750	0.019 7653	0.022 8535	
	28 302 8 17.5	3 14 0.4	6 27.1	6 45 49.2	6 7.2	9.635 6936	0.025 9140	0.028 9463	
	29 305 24 16.4	3 18 0.4	5 8.8	6 51 20.7	4 54.8	9.631 3452	0.031 9501	0.034 9253	
	30 308 44 24.7	3 22 19.2	3 44.8	6 55 37.1	3 37.0	9.626 7315	0.037 8713	0.040 7877	
May 1	312 9 1.4	3 26 57.5	+ 2 15.8	— 6 58 32.7	— 2 13.1	9.621 8553	0.043 6739	0.046 5295	
	2 315 38 26.4	3 31 55.9	+ 0 42.7	7 0 1.2	— 0 42.5	9.616 7210	0.049 3537	0.052 1461	
	3 319 13 0.2	3 37 15.2	— 0 53.2	6 59 55.9	+ 0 54.6	9.611 3346	0.054 9057	0.057 6315	
	4 322 53 3.9	3 42 55.9	2 30.8	6 58 9.5	2 39.3	9.605 7037	0.060 3229	0.062 9793	
	5 326 38 59.4	3 48 58.7	4 8.4	6 54 34.4	4 32.1	9.599 8383	0.065 5997	0.068 1830	
	6 330 31 8.8	3 55 23.8	— 5 44.3	— 6 49 2.5	+ 6 33.1	9.593 7515	0.070 7279	0.073 2334	
	7 334 29 54.4	4 2 11.3	7 16.4	6 41 25.4	8 42.6	9.587 4596	0.075 6981	0.078 1208	
	8 338 35 38.9	4 9 21.4	8 42.5	6 31 34.5	11 0.7	9.580 9821	0.080 5002	0.082 8347	
	9 342 48 44.6	4 16 53.6	10 0.1	6 19 21.0	13 27.5	9.574 3427	0.085 1227	0.087 3626	
	10 347 9 33.2	4 24 47.0	11 6.5	6 4 36.5	16 2.6	9.567 5704	0.089 5526	0.091 6908	
	11 351 38 25.3	4 33 0.4	— 11 59.1	— 5 47 13.1	+ 18 45.4	9.560 7001	0.093 7753	0.095 8042	
	12 356 15 40.1	4 41 31.9	12 35.0	5 27 3.5	21 34.8	9.553 7726	0.097 7752	0.099 6860	
	13 1 1 34.4	4 50 18.8	12 51.5	5 4 1.8	24 29.3	9.546 8352	0.101 5345	0.103 3185	
	14 5 56 21.8	4 59 17.6	12 46.2	4 38 4.0	27 26.6	9.539 9424	0.105 0352	0.106 6822	
	15 11 0 12.1	5 8 23.7	12 17.2	4 9 8.7	30 23.8	9.533 1560	0.108 2567	0.109 7561	
	16 16 13 9.9	5 17 31.8	— 11 23.3	— 3 37 17.5	+ 33 17.7	9.526 5450	0.111 1775	0.112 5184	
	17 21 35 14.0	5 26 34.9	— 10 4.1	— 3 2 35.9	+ 36 3.8	9.520 1853	0.113 7758	0.114 9467	

## MERCURY.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
May 16	16 13 9.9	5 17 31.8	- 11 23.3	- 3 37 17.5	+ 33 17.7	9.526 5450	0.111 1775	0.112 5184
17	21 35 14.0	5 26 34.9	10 4.1	3 2 35.9	36 3.8	9.520 1853	0.113 7758	0.114 9467
18	27 6 15.6	5 35 25.5	8 20.5	2 25 14.2	38 37.0	9.514 1582	0.116 0284	0.117 0181
19	32 45 57.9	5 43 54.6	6 14.9	1 45 27.9	40 52.0	9.508 5496	0.117 9131	0.118 7104
20	38 33 54.5	5 51 52.6	3 51.0	1 3 38.2	42 42.8	9.503 4474	0.119 4073	0.120 0009
21	44 29 29.2	5 59 8.9	- 1 14.1	- 0 20 12.1	+ 44 3.8	9.498 9385	0.120 4891	0.120 8695
22	50 31 54.9	6 5 32.9	+ 1 29.1	+ 0 24 17.8	44 49.5	9.495 1059	0.121 1399	0.121 2980
23	56 40 14.2	6 10 54.3	4 10.7	1 9 13.8	44 55.4	9.492 0252	0.121 3422	0.121 2708
24	62 53 19.3	6 15 3.2	6 42.6	1 53 54.6	44 18.7	9.489 7601	0.121 0823	0.120 7757
25	69 9 53.7	6 17 51.5	8 56.6	2 37 36.7	42 57.9	9.488 3594	0.120 3502	0.119 8053
26	75 28 33.6	6 19 13.2	+ 10 45.2	+ 3 19 36.1	+ 40 53.8	9.487 8543	0.119 1406	0.118 3560
27	81 47 50.0	6 19 4.5	12 2.5	3 59 11.0	38 9.5	9.488 2563	0.117 4519	0.116 4291
28	88 6 12.3	6 17 24.9	12 44.6	4 35 43.5	34 50.0	9.489 5563	0.115 2884	0.114 0308
29	94 22 10.3	6 14 16.5	12 49.9	5 8 41.4	31 1.4	9.491 7251	0.112 6579	0.111 1714
30	100 34 17.5	6 9 44.5	12 19.0	5 37 39.3	26 51.4	9.494 7161	0.109 5731	0.107 8649
31	106 41 14.1	6 3 56.7	+ 11 14.8	+ 6 2 19.9	+ 22 28.2	9.498 4666	0.106 0495	0.104 1291
June 1	112 41 48.9	5 57 2.5	9 42.1	6 22 33.8	17 59.3	9.502 9027	0.102 1065	0.099 9843
2	118 35 0.8	5 49 13.0	7 46.6	6 38 19.1	13 32.1	9.507 9418	0.097 7655	0.095 4527
3	124 20 0.4	5 40 39.7	5 35.0	6 49 40.6	9 12.7	9.513 4971	0.093 0491	0.090 5577
4	129 56 9.5	5 31 34.1	3 13.9	6 56 48.7	5 5.9	9.519 4810	0.087 9815	0.085 3233
5	135 23 1.6	5 22 7.3	+ 0 49.7	+ 6 59 57.8	+ 1 15.5	9.525 8072	0.082 5863	0.079 7735
6	140 40 20.3	5 12 29.2	- 1 32.1	6 59 25.9	- 2 16.0	9.532 3934	0.076 8876	0.073 9315
7	145 47 59.1	5 2 48.7	3 46.7	6 55 32.4	5 27.5	9.539 1635	0.070 9080	0.067 8199
8	150 45 59.3	4 53 13.2	5 50.2	6 48 37.6	8 18.5	9.546 0475	0.064 6699	0.061 4605
9	155 34 29.2	4 43 49.0	7 39.9	6 39 2.0	10 49.3	9.552 9827	0.058 1941	0.054 8732
10	160 13 42.5	4 34 40.7	- 9 14.0	+ 6 27 5.3	- 13 0.8	9.559 9140	0.051 5002	0.048 0772
11	164 43 57.2	4 25 52.4	10 31.3	6 13 6.3	14 54.1	9.566 7929	0.044 6062	0.041 0893
12	169 5 34.9	4 17 26.7	11 31.3	5 57 22.6	16 30.7	9.573 5780	0.037 5286	0.033 9259
13	173 18 58.7	4 9 25.2	12 14.3	5 40 10.0	17 52.1	9.580 2343	0.030 2830	0.026 6015
14	177 24 33.6	4 1 48.9	12 40.9	5 21 43.0	18 59.7	9.586 7318	0.022 8831	0.019 1295
15	181 22 45.1	3 54 38.5	- 12 51.8	+ 5 2 14.6	- 19 55.2	9.593 0462	0.015 3420	0.011 5223
16	185 13 59.3	3 47 54.2	12 48.3	4 41 56.2	20 39.9	9.599 1570	0.007 6715	0.003 7912
17	188 58 41.9	3 41 35.3	12 31.6	4 20 58.0	21 15.1	9.605 0481	9.999 8824	9.995 9465
18	192 37 18.3	3 35 41.6	12 3.0	3 59 28.8	21 42.0	9.610 7061	9.991 9845	9.987 9978
19	196 10 13.2	3 30 12.2	11 23.9	3 37 36.4	22 1.7	9.616 1207	9.983 9874	9.979 9544
20	199 37 50.5	3 25 6.2	- 10 35.6	+ 3 15 27.4	- 22 15.2	9.621 2838	9.975 8999	9.971 8249
21	203 0 33.3	3 20 23.0	9 39.4	2 53 7.7	22 23.4	9.626 1895	9.967 7305	9.963 6179
22	206 18 43.8	3 16 1.4	8 36.6	2 30 42.2	22 26.9	9.630 8334	9.959 4880	9.955 3418
23	209 32 43.0	3 12 0.4	7 28.5	2 8 15.2	22 26.4	9.635 2122	9.951 1804	9.947 0048
24	212 42 51.3	3 8 19.4	6 16.1	1 45 50.6	22 22.3	9.639 3240	9.942 8162	9.938 6156
25	215 49 28.1	3 4 57.2	- 5 0.6	+ 1 23 31.5	- 22 15.3	9.643 1676	9.934 4043	9.930 1835
26	218 52 51.6	3 1 53.1	3 42.8	1 1 20.7	22 5.8	9.646 7423	9.925 9543	9.921 7179
27	221 53 19.9	2 59 6.2	2 23.8	0 39 20.5	21 54.1	9.650 0482	9.917 4756	9.913 2286
28	224 51 9.5	2 56 35.7	- 1 4.4	+ 0 17 33.1	21 40.3	9.653 0858	9.908 9787	9.904 7276
29	227 46 36.7	2 54 21.1	+ 0 14.7	- 0 3 59.7	21 24.9	9.655 8556	9.900 4767	9.896 2274
30	230 39 56.9	2 52 21.8	+ 1 32.6	- 0 25 16.3	- 21 8.0	9.658 3586	9.891 9816	9.887 7408
July 1	233 31 25.2	2 50 37.2	+ 2 48.8	- 0 46 15.3	- 20 49.7	9.660 5958	9.883 5074	9.879 2835

MERCURY.																
GREENWICH MEAN NOON.																
Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.		Reduction to Orbit.		Heliocentric Latitude.		Daily Motion.		Logarithm of Radius Vector.		Logarithm of Distance from Earth—		
	°	'	"	°	"	'	"	°	'	"	'	"		At Date.	At Intermediate Date.	
July	1	233	31	25.2	2 50	37.2	+ 2	48.8	- 0	46	15.3	- 20	49.7	9.660 5958	9.883 5074	9.879 2835
	2	236	21	15.9	2 49	6.6	4	2.6	1	6	55.3	20	30.1	9.662 5680	9.875 0713	9.870 8730
	3	239	9	43.0	2 47	49.7	5	13.4	1	27	15.2	20	9.5	9.664 2764	9.866 6911	9.862 5283
	4	241	56	59.9	2 46	46.2	6	20.8	1	47	13.9	19	47.7	9.665 7219	9.858 3875	9.854 2716
	5	244	43	19.8	2 45	55.8	7	24.0	2	6	50.2	19	24.8	9.666 9053	9.850 1840	9.846 1279
	6	247	28	55.6	2 45	18.0	+ 8	22.9	- 2	26	3.2	- 19	0.9	9.667 8273	9.842 1070	9.838 1251
	7	250	13	59.9	2 44	52.7	9	17.0	2	44	51.7	18	36.0	9.668 4885	9.834 1857	9.830 2933
	8	252	58	45.1	2 44	39.8	10	5.7	3	3	14.9	18	10.1	9.668 8893	9.826 4521	9.822 6672
	9	255	43	23.6	2 44	39.1	10	48.8	3	21	11.5	17	42.9	9.669 0301	9.818 9433	9.815 2854
	10	258	28	7.5	2 44	50.7	11	26.0	3	38	40.3	17	14.6	9.668 9109	9.811 6989	9.808 1896
	11	261	13	9.2	2 45	14.5	+ 11	56.9	- 3	55	40.3	- 16	45.1	9.668 5317	9.804 7631	9.801 4254
	12	263	58	40.7	2 45	50.5	12	21.2	4	12	10.0	16	14.2	9.667 8921	9.798 1830	9.795 0425
	13	266	44	54.4	2 46	38.9	12	38.7	4	28	8.2	15	41.9	9.666 9919	9.792 0106	9.789 0942
	14	269	32	2.7	2 47	39.8	12	49.1	4	43	33.2	15	7.8	9.665 8304	9.786 3003	9.783 6360
	15	272	20	18.2	2 48	53.4	12	52.3	4	58	23.2	14	32.0	9.664 4069	9.781 1087	9.778 7260
	16	275	9	53.8	2 50	19.9	+ 12	47.9	- 5	12	36.5	- 13	54.2	9.662 7204	9.776 4953	9.774 4239
	17	278	1	2.5	2 51	59.7	12	36.0	5	26	10.9	13	14.3	9.660 7702	9.772 5196	9.770 7898
	18	280	53	57.8	2 53	53.1	12	16.4	5	39	4.3	12	32.1	9.658 5551	9.769 2416	9.767 8824
	19	283	48	53.5	2 56	0.5	11	49.0	5	51	14.1	11	47.0	9.656 0741	9.766 7190	9.765 7579
	20	286	46	3.7	2 58	22.4	11	13.8	6	2	37.4	10	59.2	9.653 3265	9.765 0057	9.764 4684
	21	289	45	43.3	3 0	59.2	+ 10	30.8	- 6	13	11.4	- 10	8.1	9.650 3113	9.764 1515	9.764 0599
	22	292	48	7.3	3 3	51.5	9	40.2	6	22	52.6	9	13.5	9.647 0277	9.764 1982	9.764 5703
	23	295	53	31.6	3 6	59.9	8	42.2	6	31	37.3	8	15.1	9.643 4754	9.765 1796	9.766 0290
	24	299	2	12.7	3 10	25.0	7	36.9	6	39	21.4	7	12.3	9.639 6544	9.767 1202	9.768 4542
	25	302	14	27.5	3 14	7.5	6	24.8	6	46	0.5	6	5.0	9.635 5650	9.770 0315	9.771 8520
	26	305	30	33.8	3 18	8.1	+ 5	6.3	- 6	51	29.8	- 4	52.6	9.631 2085	9.773 9147	9.776 2178
	27	308	50	50.0	3 22	27.4	3	42.1	6	55	43.8	3	34.5	9.626 5867	9.778 7586	9.781 5340
	28	312	15	35.2	3 27	6.3	2	13.0	6	58	36.8	2	10.4	9.621 7027	9.784 5399	9.787 7715
	29	315	45	9.3	3 32	5.4	+ 0	39.8	7	0	2.5	- 0	39.8	9.616 5608	9.791 2237	9.794 8908
	30	319	19	52.9	3 37	25.3	- 0	56.2	6	59	54.2	+ 0	57.7	9.611 1671	9.798 7663	9.802 8431
	31	323	0	7.0	3 43	6.7	- 2	33.8	- 6	58	4.6	+ 2	42.8	9.605 5292	9.807 1140	9.811 5714
Aug.	1	326	46	13.5	3 49	10.0	4	11.4	6	54	26.0	4	35.8	9.599 6573	9.816 2071	9.821 0127
	2	330	38	34.5	3 55	35.8	5	47.2	6	48	50.3	6	37.0	9.593 5643	9.825 9796	9.831 0989
	3	334	37	32.5	4 2	24.1	7	19.1	6	41	9.2	8	46.8	9.587 2662	9.836 3615	9.841 7582
	4	338	43	30.1	4 9	34.8	8	45.0	6	31	14.0	11	5.1	9.580 7832	9.847 2799	9.852 9177
	5	342	56	49.5	4 17	7.6	- 10	2.3	- 6	18	56.1	+ 13	32.1	9.574 1393	9.858 6621	9.864 5037
	6	347	17	52.4	4 25	1.7	11	8.4	6	4	6.9	16	7.6	9.567 3638	9.870 4334	9.876 4420
	7	351	46	59.5	4 33	15.7	12	0.5	5	46	38.4	18	50.6	9.560 4913	9.882 5207	9.888 6602
	8	356	24	29.8	4 41	47.7	12	35.8	5	26	23.6	21	40.1	9.553 5630	9.894 8518	9.901 0863
	9	1	10	40.0	4 50	35.0	12	51.7	5	3	16.6	24	34.6	9.546 6262	9.907 3554	9.913 6505
	10	6	5	43.7	4 59	34.0	- 12	45.7	- 4	37	13.4	+ 27	31.9	9.539 7357	9.919 9633	9.926 2854
	11	11	9	50.4	5 8	40.2	12	15.9	4	8	12.6	30	29.2	9.532 9537	9.932 6088	9.938 9251
	12	16	23	4.7	5 17	48.1	11	21.2	3	36	16.1	33	22.9	9.526 3494	9.945 2267	9.951 5058
	13	21	45	25.1	5 26	51.1	10	1.2	3	1	29.5	36	8.6	9.519 9986	9.957 7548	9.963 9662
	14	27	16	42.7	5 35	41.1	8	16.9	2	24	3.2	38	41.4	9.513 9832	9.970 1326	9.976 2471
	15	32	56	40.2	5 44	9.5	- 6	10.7	- 1	44	12.8	+ 40	55.8	9.508 3887	9.982 3027	9.988 2922
	16	38	44	51.2	5 52	6.4	- 3	46.3	- 1	2	19.7	+ 42	45.8	9.503 3032	9.994 2096	0.000 0481



## MERCURY.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
Aug. 16	38	44	51.2	5 52 6.4	- 3 46.3	- 1	2	19.7	+ 42 45.8	9.503 3032	9.994 2096	0.000 0481
17	44	40	38.9	5 59 21.3	- 1 9.1	- 0	18	51.2	44 5.7	9.498 8137	0.005 8016	0.011 4643
18	50	43	16.2	6 5 43.6	+ 1 34.0	+ 0	25	40.0	44 50.3	9.495 0031	0.017 0306	0.022 4950
19	56	51	45.0	6 11 2.7	4 15.5	1	10	36.2	44 55.0	9.491 9461	0.027 8525	0.033 0985
20	63	4	57.4	6 15 9.4	6 47.0	1	55	15.9	44 16.9	9.489 7065	0.038 2283	0.043 2376
21	69	21	36.7	6 17 55.1	+ 9 0.3	+ 2	38	55.4	+ 42 54.7	9.488 3325	0.048 1232	0.052 8820
22	75	40	18.8	6 19 14.2	10 48.1	3	20	51.0	40 49.4	9.487 8548	0.057 5110	0.062 0076
23	81	59	34.9	6 19 2.8	12 4.4	4	0	20.9	38 4.0	9.488 2841	0.066 3699	0.070 5962
24	88	17	54.0	6 17 20.4	12 45.4	4	36	47.3	34 43.4	9.489 6108	0.074 6854	0.078 6365
25	94	33	46.1	6 14 9.4	12 49.5	5	9	38.1	30 54.1	9.491 8052	0.082 4492	0.086 1237
26	100	45	45.0	6 9 35.0	+ 12 17.5	+ 5	38	28.4	+ 26 43.7	9.494 8198	0.089 6603	0.093 0597
27	106	52	30.9	6 3 45.0	11 12.4	6	3	1.0	22 20.1	9.498 5922	0.096 3230	0.099 4515
28	112	52	53.0	5 56 49.0	9 38.9	6	23	6.7	17 51.1	9.503 0477	0.102 4468	0.105 3110
29	118	45	50.6	5 48 58.0	7 42.8	6	38	43.8	13 24.0	9.508 1036	0.108 0461	0.110 6542
30	124	30	34.5	5 40 23.6	5 30.8	6	49	57.4	9 5.0	9.513 6731	0.113 1380	0.115 5001
31	130	6	27.1	5 31 17.3	+ 3 9.5	+ 6	56	57.9	+ 4 58.6	9.519 6684	0.117 7432	0.119 8702
Sept. 1	135	33	2.0	5 21 49.8	+ 0 45.2	7	0	0.1	+ 1 8.8	9.526 0035	0.121 8839	0.123 7874
2	140	50	3.2	5 12 11.5	- 1 36.3	6	59	21.7	- 2 22.0	9.532 5965	0.125 5836	0.127 2752
3	145	57	24.4	5 2 31.1	3 50.6	6	55	22.3	5 32.9	9.539 3711	0.128 8654	0.130 3573
4	150	55	7.1	4 52 55.8	5 53.8	6	48	22.3	8 23.4	9.546 2572	0.131 7536	0.133 0572
5	155	43	19.9	4 43 32.1	- 7 43.1	+ 6	38	42.1	- 10 53.6	9.553 1930	0.134 2710	0.135 3978
6	160	22	16.7	4 34 24.5	9 16.6	6	26	41.4	13 4.6	9.560 1233	0.136 4400	0.137 4006
7	164	52	15.6	4 25 36.8	10 33.3	6	12	38.9	14 57.4	9.567 0003	0.138 2819	0.139 0862
8	169	13	37.9	4 17 11.6	11 32.9	5	56	52.1	16 33.4	9.573 7816	0.139 8160	0.140 4737
9	173	26	47.1	4 9 10.8	12 15.4	5	39	37.1	17 54.4	9.580 4335	0.141 0612	0.141 5808
10	177	32	8.2	4 1 35.5	- 12 41.4	+ 5	21	8.0	- 19 1.6	9.586 9258	0.142 0345	0.142 4241
11	181	30	6.7	3 54 26.0	12 51.9	5	1	37.9	19 56.7	9.593 2344	0.142 7517	0.143 0189
12	185	21	8.7	3 47 42.4	12 48.0	4	41	18.2	20 41.1	9.599 3387	0.143 2273	0.143 3783
13	189	5	39.9	3 41 24.3	12 30.9	4	20	18.9	21 16.0	9.605 2228	0.143 4736	0.143 5147
14	192	44	5.6	3 35 31.2	12 2.0	3	58	48.9	21 42.7	9.610 8736	0.143 5029	0.143 4393
15	196	16	50.5	3 30 2.5	- 11 22.5	+ 3	36	55.8	- 22 2.3	9.616 2808	0.143 3252	0.143 1620
16	199	44	18.5	3 24 57.3	10 34.0	3	14	46.4	22 15.6	9.621 4363	0.142 9504	0.142 6915
17	203	6	52.8	3 20 14.7	9 37.6	2	52	26.4	22 23.6	9.626 3341	0.142 3862	0.142 0355
18	206	24	55.3	3 15 53.7	8 34.6	2	30	0.8	22 26.9	9.630 9700	0.141 6401	0.141 2008
19	209	38	47.2	3 11 53.4	7 26.3	2	7	33.9	22 26.2	9.635 3409	0.140 7183	0.140 1931
20	212	48	48.8	3 8 12.9	- 6 13.8	+ 1	45	9.4	- 22 22.2	9.639 4442	0.139 6259	0.139 0171
21	215	55	19.4	3 4 51.3	4 58.2	1	22	50.4	22 15.2	9.643 2795	0.138 3673	0.137 6771
22	218	58	37.5	3 1 47.7	3 40.4	1	0	39.9	22 5.5	9.646 8462	0.136 9468	0.136 1766
23	221	59	0.6	2 59 1.3	2 21.3	0	38	40.1	21 53.7	9.650 1441	0.135 3667	0.134 5175
24	224	56	45.6	2 56 31.4	- 1 1.9	+ 0	16	53.1	21 39.9	9.653 1736	0.133 6293	0.132 7022
25	227	52	8.7	2 54 17.4	+ 0 17.1	- 0	4	39.2	- 21 24.5	9.655 9353	0.131 7365	0.130 7319
26	230	45	25.4	2 52 18.4	1 35.0	0	25	55.3	21 7.5	9.658 4303	0.129 6886	0.128 6067
27	233	36	50.5	2 50 34.2	2 51.1	0	46	53.7	20 49.1	9.660 6595	0.127 4861	0.126 3267
28	236	26	38.5	2 49 4.0	4 4.8	1	7	33.2	20 29.6	9.662 6236	0.125 1284	0.123 8914
29	239	15	3.2	2 47 47.6	5 15.5	1	27	52.4	20 8.8	9.664 3240	0.122 6153	0.121 2999
30	242	2	18.1	2 46 44.5	+ 6 22.7	- 1	47	50.4	- 19 47.0	9.665 7616	0.119 9450	0.118 5502
Oct. 1	244	48	36.5	2 45 54.4	+ 7 25.9	- 2	7	26.0	- 19 24.1	9.666 9370	0.117 1154	0.115 6404

MERCURY.									
GREENWICH MEAN NOON.									
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
							At Date.	At Intermediate Date.	
Oct.	1	244 48 36.5	2 45 54.4	+ 7 25.9	- 2 7 26.0	-19 24.1	9.666 9370	0.117 1154	0.115 6404
	2	247 34 11.2	2 45 17.0	8 24.6	2 26 38.3	19 0.2	9.667 8510	0.114 1247	0.112 5679
	3	250 19 14.7	2 44 52.1	9 18.5	2 45 26.1	18 35.2	9.668 5042	0.110 9695	0.109 3293
	4	253 3 59.5	2 44 39.5	10 7.1	3 3 48.4	18 9.2	9.668 8972	0.107 6466	0.105 9210
	5	255 48 37.9	2 44 39.3	10 50.1	3 21 44.2	17 42.1	9.669 0300	0.104 1519	0.102 3390
	6	258 33 22.2	2 44 51.3	+ 11 27.0	- 3 39 12.2	-17 13.7	9.668 9029	0.100 4815	0.098 5789
	7	261 18 24.6	2 45 15.4	11 57.7	3 56 11.3	16 44.2	9.668 5157	0.096 6304	0.094 6356
	8	264 3 57.2	2 45 51.8	12 21.9	4 12 40.1	16 13.2	9.667 8683	0.092 5935	0.090 5035
	9	266 50 12.3	2 46 40.6	12 39.2	4 28 37.2	15 40.8	9.666 9600	0.088 3648	0.086 1765
	10	269 37 22.5	2 47 41.9	12 49.3	4 44 1.1	15 6.7	9.665 7903	0.083 9380	0.081 6487
	11	272 25 40.3	2 48 55.9	+ 12 52.2	- 4 58 50.0	-14 30.9	9.664 3586	0.079 3074	0.076 9132
	12	275 15 18.5	2 50 22.8	12 47.7	5 13 2.2	13 53.1	9.662 6640	0.074 4652	0.071 9625
	13	278 6 30.3	2 52 3.0	12 35.5	5 26 35.4	13 13.0	9.660 7057	0.069 4042	0.066 7894
	14	280 59 29.0	2 53 56.8	12 15.7	5 39 27.4	12 30.6	9.658 4825	0.064 1170	0.061 3859
	15	283 54 28.6	2 56 4.6	11 48.0	5 51 35.8	11 45.6	9.655 9934	0.058 5951	0.055 7436
	16	286 51 43.1	2 58 26.9	+ 11 12.6	- 6 2 57.7	-10 57.7	9.653 2375	0.052 8303	0.049 8542
	17	289 51 27.4	3 1 4.0	10 29.4	6 13 30.1	10 6.5	9.650 2139	0.046 8142	0.043 7091
	18	292 53 56.8	3 3 56.8	9 38.6	6 23 9.6	9 11.8	9.646 9222	0.040 5379	0.037 2994
	19	295 59 26.9	3 7 5.9	8 40.3	6 31 52.5	8 13.2	9.643 3615	0.033 9924	0.030 6159
	20	299 8 14.2	3 10 31.6	7 34.8	6 39 34.7	7 10.4	9.639 5321	0.027 1690	0.023 6509
	21	302 20 35.9	3 14 14.6	+ 6 22.4	- 6 46 11.7	- 6 2.8	9.635 4342	0.020 0604	0.016 3964
	22	305 36 49.5	3 18 15.8	5 3.8	6 51 38.7	4 50.3	9.631 0695	0.012 6580	0.008 8445
	23	308 57 13.7	3 22 35.7	3 39.4	6 55 50.4	3 32.1	9.626 4394	0.004 9553	0.000 9895
	24	312 22 7.5	3 27 15.1	2 10.2	6 58 40.8	2 7.7	9.621 5474	9.996 9468	9.992 8269
	25	315 51 50.9	3 32 14.9	+ 0 36.9	7 0 3.7	- 0 36.9	9.616 3974	9.988 6297	9.984 3551
	26	319 26 44.3	3 37 35.5	- 0 59.2	- 6 59 52.4	+ 1 0.8	9.610 9958	9.980 0034	9.975 5750
	27	323 7 9.0	3 43 17.5	2 36.8	6 57 59.5	2 46.1	9.605 3503	9.971 0708	9.966 4919
	28	326 53 26.7	3 49 21.6	4 14.4	6 54 17.5	4 39.3	9.599 4711	9.961 8401	9.957 1174
	29	330 45 59.6	3 55 48.0	5 50.1	6 48 38.1	6 40.8	9.593 3713	9.952 3263	9.947 4697
	30	334 45 10.3	4 2 37.1	7 21.9	6 40 53.0	8 50.8	9.587 0672	9.942 5513	9.937 5758
	31	338 51 21.2	4 9 48.6	- 8 47.5	- 6 30 53.5	+ 11 9.6	9.580 5787	9.932 5482	9.927 4745
Nov.	1	343 4 54.7	4 17 22.1	10 4.5	6 18 31.0	13 36.9	9.573 9299	9.922 3619	9.917 2185
	2	347 26 12.4	4 25 16.8	11 10.2	6 3 37.0	16 12.4	9.567 1507	9.912 0535	9.906 8774
	3	351 55 34.9	4 33 31.4	12 1.8	5 46 3.5	18 55.7	9.560 2757	9.901 7021	9.896 5410
	4	356 33 21.2	4 42 4.0	12 36.6	5 25 43.5	21 45.4	9.553 3460	9.891 4088	9.886 3220
	5	1 19 47.8	4 50 51.6	- 12 51.8	- 5 2 31.1	+ 24 40.1	9.546 4094	9.881 2988	9.876 3592
	6	6 15 8.3	4 59 51.0	12 45.1	4 36 22.4	27 37.5	9.539 5211	9.871 5247	9.866 8186
	7	11 19 32.2	5 8 57.4	12 14.6	4 7 16.2	30 34.7	9.532 7432	9.862 2661	9.857 8936
	8	16 33 3.7	5 18 5.3	11 19.1	3 35 14.3	33 28.2	9.526 1453	9.853 7290	9.849 8012
	9	21 55 41.2	5 27 8.0	9 58.4	3 0 22.5	36 13.6	9.519 8035	9.846 1402	9.842 7761
	10	27 27 15.4	5 35 57.6	- 8 13.4	- 2 22 51.4	+ 38 45.9	9.513 7994	9.839 7391	9.837 0588
	11	33 7 29.0	5 44 25.1	6 6.4	1 42 56.9	40 59.6	9.508 2192	9.834 7636	9.832 8800
	12	38 55 55.1	5 52 20.8	3 41.6	1 1 0.3	42 48.8	9.503 1507	9.831 4321	9.830 4411
	13	44 51 56.6	5 59 34.2	- 1 4.1	- 0 17 29.3	44 7.7	9.498 6809	9.829 9245	9.829 8955
	14	50 54 46.0	6 5 54.7	+ 1 39.1	+ 0 27 3.4	44 51.1	9.494 8924	9.830 3627	9.831 3298
	15	57 3 25.0	6 11 11.8	+ 4 20.4	+ 1 11 59.7	+ 44 54.5	9.491 8599	9.832 7951	9.834 7515
	16	63 16 45.5	6 15 16.1	+ 6 51.5	+ 1 56 38.2	+ 44 15.0	9.489 6465	9.837 1875	9.840 0870

## MERCURY.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
											At Date.	At Interme- diate Date.
Nov. 16	63	16	45.5	6 15 16.1	+ 6 51.5	+ 1	56	38.2	+ 44 15.0	9.489 6465	9.837 1875	9.840 0870
17	69	33	30.3	6 17 59.3	9 4.1	2	40	15.2	42 51.5	9.488 3002	9.843 4289	9.847 1883
18	75	52	15.1	6 19 15.6	10 50.9	3	22	7.0	40 44.9	9.487 8506	9.851 3374	9.855 8456
19	82	11	31.2	6 19 1.2	12 6.2	4	1	31.8	37 58.3	9.488 3081	9.860 6805	9.865 8086
20	88	29	47.4	6 17 16.1	12 46.1	4	37	51.9	34 36.6	9.489 6625	9.871 1960	9.876 8687
21	94	45	33.9	6 14 2.4	+ 12 49.0	+ 5	10	35.6	+ 30 46.6	9.491 8833	9.882 6130	9.888 5765
22	100	57	24.5	6 9 25.5	12 16.0	5	39	18.1	26 35.6	9.494 9230	9.894 6684	9.900 8593
23	107	3	59.8	6 3 33.3	11 9.9	6	3	42.5	22 11.8	9.498 7179	9.907 1217	9.913 4300
24	113	4	9.2	5 56 35.4	9 35.5	6	23	39.9	17 42.8	9.503 1935	9.919 7610	9.926 0937
25	118	56	52.3	5 48 42.8	7 38.9	6	39	8.7	13 15.9	9.508 2669	9.932 4088	9.938 6893
26	124	41	20.4	5 40 7.2	+ 5 26.5	+ 6	50	14.3	+ 8 57.1	9.513 8513	9.944 9200	9.951 0878
27	130	16	56.1	5 30 59.9	3 5.0	6	57	7.1	4 51.3	9.519 8589	9.957 1815	9.963 1914
28	135	43	13.4	5 21 32.2	+ 0 40.8	7	0	2.1	+ 1 1.9	9.526 2035	9.969 1089	9.974 9270
29	140	59	56.8	5 11 33.6	- 1 40.7	6	59	17.2	- 2 28.4	9.532 8033	9.980 6399	9.986 2433
30	146	6	59.9	5 2 13.0	3 54.6	6	55	11.9	5 38.7	9.539 5824	9.991 7334	9.997 1073
Dec. 1	151	4	24.8	4 52 38.1	- 5 57.4	+ 6	48	6.6	- 8 28.4	9.546 4714	0.002 3634	0.007 5004
2	155	52	20.1	4 43 14.8	7 46.2	6	38	21.7	10 58.0	9.553 4081	0.012 5176	0.017 4149
3	160	30	59.9	4 34 7.7	9 19.2	6	26	16.9	13 8.4	9.560 3375	0.022 1925	0.026 8503
4	165	0	42.3	4 25 20.7	10 35.4	6	12	10.9	15 0.6	9.567 2119	0.031 3902	0.035 8135
5	169	21	48.9	4 16 56.4	11 34.4	5	56	21.2	16 36.1	9.573 9902	0.040 1218	0.044 3164
6	173	34	43.2	4 8 56.4	- 12 16.4	+ 5	39	3.6	- 17 56.7	9.580 6376	0.048 3993	0.052 3722
7	177	39	50.1	4 1 21.8	12 42.0	5	20	32.4	19 3.5	9.587 1248	0.056 2374	0.059 9972
8	181	37	35.3	3 54 13.0	12 52.0	5	1	0.6	19 58.3	9.593 4273	0.063 6536	0.067 2087
9	185	28	24.7	3 47 30.1	12 47.7	4	40	39.4	20 42.3	9.599 5251	0.070 6648	0.074 0242
10	189	12	44.1	3 41 12.8	12 30.2	4	19	39.1	21 16.9	9.605 4022	0.077 2890	0.080 4614
11	192	50	58.7	3 35 20.6	- 12 0.9	+ 3	58	8.3	- 21 43.4	9.611 0457	0.083 5436	0.086 5379
12	196	23	33.4	3 29 52.7	11 21.1	3	36	14.6	22 2.8	9.616 4451	0.089 4462	0.092 2705
13	199	50	51.9	3 24 48.2	10 32.3	3	14	4.8	22 15.9	9.621 5927	0.095 0128	0.097 6754
14	203	13	17.3	3 20 6.3	9 35.7	2	51	44.5	22 23.8	9.626 4825	0.100 2599	0.102 7681
15	206	31	11.7	3 15 45.9	8 32.6	2	29	18.8	22 26.9	9.631 1102	0.105 2018	0.107 5630
16	209	44	56.1	3 11 46.2	- 7 24.1	+ 2	6	51.9	- 22 26.2	9.635 4726	0.109 8532	0.112 0740
17	212	54	50.8	3 8 6.4	6 11.5	1	44	27.5	22 22.0	9.639 5679	0.114 2269	0.116 3136
18	216	1	15.2	3 4 45.3	4 55.8	1	22	8.8	22 14.8	9.643 3950	0.118 3354	0.120 2939
19	219	4	27.5	3 1 42.2	3 37.9	0	59	58.6	22 5.1	9.646 9531	0.122 1902	0.124 0257
20	222	4	45.4	2 58 56.4	2 18.9	0	37	59.2	21 53.3	9.650 2425	0.125 8016	0.127 5193
21	225	2	25.7	2 56 26.9	- 0 59.4	+ 0	16	12.6	- 21 39.5	9.653 2636	0.129 1797	0.130 7839
22	227	57	44.6	2 54 13.4	+ 0 19.5	- 0	5	19.3	21 23.9	9.656 0170	0.132 3330	0.133 8281
23	230	50	57.6	2 52 15.0	1 37.4	0	26	34.8	21 6.9	9.658 5037	0.135 2701	0.136 6600
24	233	42	19.5	2 50 31.1	2 53.4	0	47	32.6	20 48.5	9.660 7245	0.137 9986	0.139 2867
25	236	32	4.6	2 49 1.4	4 7.0	1	8	11.5	20 28.9	9.662 6805	0.140 5250	0.141 7144
26	239	20	26.9	2 47 45.4	+ 5 17.6	- 1	28	30.1	- 20 8.1	9.664 3728	0.142 8555	0.143 9490
27	242	7	39.9	2 46 42.7	6 24.7	1	48	27.4	19 46.3	9.665 8020	0.144 9954	0.145 9955
28	244	53	56.7	2 45 53.0	7 27.8	2	8	2.3	19 23.4	9.666 9693	0.146 9498	0.147 8588
29	247	39	30.2	2 45 16.0	8 26.4	2	27	13.8	18 59.4	9.667 8751	0.148 7229	0.149 5426
30	250	24	32.9	2 44 51.5	9 20.1	2	46	0.8	18 34.4	9.668 5203	0.150 3183	0.151 0505
31	253	9	17.3	2 44 39.4	+ 10 8.5	- 3	4	22.3	- 18 8.4	9.668 9052	0.151 7395	0.152 3854
32	255	53	55.8	2 44 39.6	+ 10 51.3	- 3	22	17.2	- 17 41.2	9.669 0300	0.152 9886	0.153 5494

VENUS.								
GREENWICH MEAN NOON.								
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
Jan.	0 117 41 20.7	1 37 24.0	+2 59.9	+2 15 56.2	+4 17.7	9.856 4446	9.582 4430	9.589 6556
	2 120 56 10.6	1 37 25.9	3 1.0	2 24 18.4	4 4.3	9.856 4135	9.596 8477	9.604 0128
	4 124 11 4.3	1 37 27.7	2 59.7	2 32 12.9	3 50.0	9.856 3917	9.611 1447	9.618 2383
	6 127 26 1.2	1 37 29.2	2 56.2	2 39 38.1	3 35.0	9.856 3793	9.625 2889	9.632 2925
	8 130 41 0.7	1 37 30.3	2 50.4	2 46 32.5	3 19.3	9.856 3763	9.639 2453	9.646 1442
	10 133 56 2.4	1 37 31.3	+2 42.3	+2 52 54.9	+3 2.9	9.856 3827	9.652 9867	9.659 7705
	12 137 11 5.5	1 37 31.8	2 32.2	2 58 43.9	2 45.9	9.856 3985	9.666 4938	9.673 1552
	14 140 26 9.5	1 37 32.1	2 20.2	3 3 58.4	2 28.5	9.856 4237	9.679 7536	9.686 2880
	16 143 41 13.6	1 37 32.0	2 6.4	3 8 37.4	2 10.5	9.856 4582	9.692 7579	9.699 1630
	18 146 56 17.3	1 37 31.6	1 50.9	3 12 40.1	1 52.1	9.856 5018	9.705 5034	9.711 7789
	20 150 11 19.8	1 37 30.8	+1 34.0	+3 16 5.5	+1 33.3	9.856 5544	9.717 9866	9.724 1354
	22 153 26 20.5	1 37 29.7	1 15.9	3 18 53.1	1 14.3	9.856 6158	9.730 2165	9.736 2328
	24 156 41 18.5	1 37 28.2	0 56.9	3 21 2.4	0 55.0	9.856 6858	9.742 1850	9.748 0731
	26 159 56 13.3	1 37 26.4	0 37.0	3 22 33.0	0 35.5	9.856 7642	9.753 8976	9.759 6590
	28 163 11 4.1	1 37 24.3	+0 16.7	3 23 24.5	+0 16.0	9.856 8508	9.765 3573	9.770 9932
	30 166 25 50.2	1 37 21.8	-0 3.7	+3 23 37.0	-0 3.6	9.856 9451	9.776 5669	9.782 0789
	Feb. 1 169 40 31.0	1 37 18.9	0 24.1	3 23 10.4	0 23.1	9.857 0470	9.787 5297	9.792 9198
	3 172 55 5.8	1 37 15.8	0 44.2	3 22 4.9	0 42.5	9.857 1561	9.798 2497	9.803 5196
	5 176 9 34.1	1 37 12.3	1 3.7	3 20 20.6	1 1.7	9.857 2720	9.808 7303	9.813 8822
	7 179 23 55.0	1 37 8.6	1 22.4	3 17 58.1	1 20.7	9.857 3944	9.818 9760	9.824 0120
	9 182 38 8.2	1 37 4.5	-1 40.0	+3 14 57.8	-1 39.5	9.857 5229	9.828 9912	9.833 9145
	11 185 52 13.1	1 37 0.3	1 56.4	3 11 20.5	1 57.8	9.857 6569	9.838 7825	9.843 5960
	13 189 6 9.2	1 36 55.7	2 11.3	3 7 6.8	2 15.8	9.857 7962	9.848 3559	9.853 0634
	15 192 19 56.0	1 36 51.0	2 24.4	3 2 17.6	2 33.3	9.857 9403	9.857 7191	9.862 3239
	17 195 33 33.2	1 36 46.1	2 35.8	2 56 54.0	2 50.2	9.858 0886	9.866 8786	9.871 3842
	19 198 47 0.3	1 36 41.0	-2 45.1	+2 50 57.1	-3 6.5	9.858 2407	9.875 8415	9.880 2516
	21 202 0 17.2	1 36 35.8	2 52.4	2 44 28.1	3 22.3	9.858 3962	9.884 6150	9.888 9326
	23 205 13 23.5	1 36 30.4	2 57.5	2 37 28.2	3 37.4	9.858 5545	9.893 2049	9.897 4324
	25 208 26 19.0	1 36 25.0	3 0.4	2 29 59.0	3 51.7	9.858 7151	9.901 6158	9.905 7561
	27 211 39 3.7	1 36 19.6	3 0.9	2 22 1.8	4 5.3	9.858 8775	9.909 8536	9.913 9088
	Mar. 1 214 51 37.4	1 36 14.1	-2 59.2	+2 13 38.2	-4 18.1	9.859 0413	9.917 9223	9.921 8945
	3 218 4 0.2	1 36 8.6	2 55.3	2 4 50.0	4 30.0	9.859 2058	9.925 8257	9.929 7165
	5 221 16 12.0	1 36 3.1	2 49.2	1 55 38.7	4 41.1	9.859 3706	9.933 5671	9.937 3781
	7 224 28 12.9	1 35 57.8	2 41.6	1 46 6.2	4 51.2	9.859 5351	9.941 1498	9.944 8826
	9 227 40 3.2	1 35 52.5	2 30.8	1 36 14.3	5 0.5	9.859 6989	9.948 5770	9.952 2336
	11 230 51 42.9	1 35 47.3	-2 18.7	+1 26 5.0	-5 8.7	9.859 8614	9.955 8528	9.959 4352
	13 234 3 12.3	1 35 42.2	2 4.9	1 15 40.0	5 16.0	9.860 0222	9.962 9812	9.966 4913
	15 237 14 31.8	1 35 37.3	1 49.5	1 5 1.5	5 22.3	9.860 1807	9.969 9663	9.973 4069
	17 240 25 41.6	1 35 32.5	1 32.8	0 54 11.4	5 27.6	9.860 3365	9.976 8133	9.980 1859
	19 243 36 42.1	1 35 28.0	1 15.0	0 43 11.6	5 31.9	9.860 4890	9.983 5254	9.986 8327
	21 246 47 33.7	1 35 23.7	-0 56.3	+0 32 4.4	-5 35.1	9.860 6379	9.990 1081	9.993 3521
	23 249 58 16.9	1 35 19.6	0 36.9	0 20 51.7	5 37.4	9.860 7826	9.996 5651	9.999 7475
	25 253 8 52.1	1 35 15.7	-0 17.0	+0 9 35.6	5 38.6	9.860 9227	0.002 8997	0.006 0220
	27 256 19 19.9	1 35 12.1	+0 3.0	-0 1 41.9	5 38.7	9.861 0578	0.009 1149	0.012 1788
	29 259 29 40.8	1 35 8.8	0 23.0	0 12 58.7	5 37.8	9.861 1875	0.015 2139	0.018 2205
	31 262 39 55.3	1 35 5.8	+0 42.7	-0 24 12.6	-5 35.8	9.861 3114	0.021 1988	0.024 1492
Apr. 2	265 50 3.9	1 35 3.0	+1 1.9	-0 35 21.8	-5 33.0	9.861 4292	0.027 0717	0.029 9664

GREENWICH MEAN NOON.

[Eph 07]

VENUS.									
GREENWICH MEAN NOON.									
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
							At Date.	At Interme- diate Date.	
July	1 48 46 31.3	1 36 14.0	- 2 26.8	- 1 32 45.6	+ 5 4.7	9.858 8758	0.199 4369	0.200 5076	
	3 51 59 2.7	1 36 17.4	2 14.0	1 22 27.6	5 13.1	9.858 7133	0.201 5616	0.202 5988	
	5 55 11 41.0	1 36 20.9	1 59.6	1 11 53.7	5 20.6	9.858 5526	0.203 6192	0.204 6228	
	7 58 24 26.3	1 36 24.4	1 43.6	1 1 5.7	5 27.1	9.858 3943	0.205 6098	0.206 5803	
	9 61 37 18.8	1 36 28.0	1 26.3	0 50 5.7	5 32.6	9.858 2388	0.207 5343	0.208 4715	
	11 64 50 18.4	1 36 31.6	- 1 7.9	- 0 38' 55.8	+ 5 37.1	9.858 0865	0.209 3921	0.210 2963	
	13 68 3 25.1	1 36 35.1	0 48.7	0 27 38.1	5 40.5	9.857 9383	0.211 1840	0.212 0556	
	15 71 16 39.0	1 36 38.7	0 28.8	0 16 14.7	5 42.8	9.857 7943	0.212 9108	0.213 7500	
	17 74 30 0.1	1 36 42.3	- 0 8.5	- 0 4 47.8	5 44.0	9.857 6551	0.214 5731	0.215 3802	
	19 77 43 28.4	1 36 45.9	+ 0 11.9	+ 0 6 40.5	5 44.1	9.857 5211	0.216 1717	0.216 9474	
	21 80 57 3.8	1 36 49.5	+ 0 32.1	+ 0 18 8.0	+ 5 43.1	9.857 3927	0.217 7076	0.218 4524	
	23 84 10 46.4	1 36 53.0	0 52.0	0 29 32.3	5 41.1	9.857 2705	0.219 1818	0.219 8960	
	25 87 24 36.0	1 36 56.5	1 11.2	0 40 51.4	5 37.9	9.857 1547	0.220 5950	0.221 2788	
	27 90 38 32.6	1 37 0.0	1 29.5	0 52 3.1	5 33.6	9.857 0458	0.221 9474	0.222 6007	
	29 93 52 35.9	1 37 3.3	1 46.6	1 3 5.2	5 28.2	9.856 9441	0.223 2388	0.223 8616	
	31 97 6 45.9	1 37 6.6	+ 2 2.4	+ 1 13 55.5	+ 5 21.8	9.856 8499	0.224 4691	0.225 0613	
Aug.	2 100 21 2.3	1 37 9.7	2 16.7	1 24 31.9	5 14.4	9.856 7636	0.225 6381	0.226 1995	
	4 103 35 24.8	1 37 12.7	2 29.2	1 34 52.3	5 5.9	9.856 6855	0.226 7456	0.227 2763	
	6 106 49 53.2	1 37 15.6	2 39.8	1 44 54.8	4 56.4	9.856 6157	0.227 7918	0.228 2920	
	8 110 4 27.1	1 37 18.3	2 48.4	1 54 37.3	4 45.9	9.856 5546	0.228 7769	0.229 2485	
	10 113 19 6.3	1 37 20.8	+ 2 54.8	+ 2 3 57.9	+ 4 34.5	9.856 5024	0.229 7010	0.230 1405	
	12 116 33 50.3	1 37 23.1	2 59.0	2 12 54.9	4 22.2	9.856 4591	0.230 5649	0.230 9744	
	14 119 48 38.7	1 37 25.2	3 0.9	2 21 26.3	4 9.1	9.856 4250	0.231 3691	0.231 7493	
	16 123 3 31.0	1 37 27.0	3 0.5	2 29 30.6	3 55.1	9.856 4002	0.232 1149	0.232 4656	
	18 126 18 26.7	1 37 28.6	2 57.7	2 37 6.2	3 40.4	9.856 3847	0.232 8018	0.233 1240	
	20 129 33 25.2	1 37 29.9	+ 2 52.7	+ 2 44 11.5	+ 3 24.9	9.856 3786	0.233 4321	0.233 7265	
	22 132 48 26.0	1 37 30.9	2 45.4	2 50 45.2	3 8.7	9.856 3820	0.234 0070	0.234 2737	
	24 136 3 28.6	1 37 31.6	2 36.0	2 56 46.0	2 51.9	9.856 3948	0.234 5266	0.234 7658	
	26 139 18 32.2	1 37 31.9	2 24.6	3 2 12.7	2 34.6	9.856 4169	0.234 9913	0.235 2030	
	28 142 33 36.2	1 37 32.0	2 11.4	3 7 4.2	2 16.8	9.856 4483	0.235 4011	0.235 5856	
	30 145 48 39.9	1 37 31.7	+ 1 56.4	+ 3 11 19.6	+ 1 58.5	9.856 4889	0.235 7563	0.235 9133	
Sept.	1 149 3 42.7	1 37 31.1	1 40.0	3 14 58.0	1 39.9	9.856 5386	0.236 0564	0.236 1859	
	3 152 18 43.9	1 37 30.1	1 22.3	3 17 58.9	1 20.9	9.856 5971	0.236 3012	0.236 4030	
	5 155 33 42.7	1 37 28.7	1 3.6	3 20 21.6	1 1.7	9.856 6644	0.236 4912	0.236 5660	
	7 158 48 38.5	1 37 27.0	0 44.0	3 22 5.7	0 42.3	9.856 7401	0.236 6272	0.236 6747	
	9 162 3 30.6	1 37 25.0	+ 0 23.9	+ 3 23 10.9	+ 0 22.8	9.856 8240	0.236 7085	0.236 7288	
	11 165 18 18.3	1 37 22.6	+ 0 3.4	3 23 37.0	+ 0 3.3	9.856 9159	0.236 7357	0.236 7294	
	13 168 33 0.8	1 37 19.9	- 0 17.0	3 23 24.0	- 0 16.3	9.857 0153	0.236 7099	0.236 6774	
	15 171 47 37.6	1 37 16.8	0 37.3	3 22 32.0	0 35.7	9.857 1221	0.236 6319	0.236 5735	
	17 175 2 7.9	1 37 13.5	0 57.0	3 21 1.3	0 55.0	9.857 2359	0.236 5025	0.236 4190	
	19 178 16 31.3	1 37 9.8	- 1 16.0	+ 3 18 52.1	- 1 14.1	9.857 3562	0.236 3230	0.236 2148	
	21 181 30 47.0	1 37 5.9	1 34.0	3 16 4.9	1 33.0	9.857 4827	0.236 0943	0.235 9617	
	23 184 44 54.6	1 37 1.7	1 50.9	3 12 40.4	1 51.5	9.857 6150	0.235 8170	0.235 6602	
	25 187 58 53.5	1 36 57.2	2 6.3	3 8 39.3	2 9.6	9.857 7526	0.235 4913	0.235 3105	
	27 191 12 43.3	1 36 52.6	2 20.0	3 4 2.4	2 27.2	9.857 8952	0.235 1176	0.234 9126	
	29 194 26 23.6	1 36 47.7	- 2 32.0	+ 2 58 50.7	- 2 44.4	9.858 0422	0.234 6955	0.234 4662	
	Oct. 1 197 39 54.0	1 36 42.7	- 2 42.1	+ 2 53 5.3	- 3 0.9	9.858 1931	0.234 2248	0.233 9714	

## VENUS.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
Oct. 1	197	39	54.0	1 36 42.7	-2 42.1	+2 53	5.3		-3 0.9	9.858 1931	0.234 2248	0.233 9714
3	200	53	14.2	1 36 37.5	2 50.1	2 46	47.4		3 16.9	9.858 3476	0.233 7058	0.233 4280
5	204	6	23.9	1 36 32.1	2 56.0	2 39	58.1		3 32.2	9.858 5050	0.233 1382	0.232 8364
7	207	19	23.0	1 36 26.8	2 59.6	2 32	39.0		3 46.8	9.858 6650	0.232 5226	0.232 1966
9	210	32	11.2	1 36 21.4	3 1.0	2 24	51.4		4 0.7	9.858 8269	0.231 8585	0.231 5084
11	213	44	48.4	1 36 15.9	-3 0.1	+2 16	36.9		-4 13.7	9.858 9903	0.231 1464	0.230 7726
13	216	57	14.7	1 36 10.4	2 57.0	2 7	57.1		4 25.9	9.859 1546	0.230 3871	0.229 9898
15	220	9	30.0	1 36 4.9	2 51.6	1 58	53.7		4 37.3	9.859 3194	0.229 5810	0.229 1608
17	223	21	34.4	1 35 59.5	2 44.1	1 49	28.4		4 47.8	9.859 4841	0.228 7294	0.228 2869
19	226	33	28.0	1 35 54.2	2 34.6	1 39	43.1		4 57.3	9.859 6482	0.227 8332	0.227 3684
21	229	45	11.1	1 35 48.9	-2 23.1	+1 29	39.6		-5 5.9	9.859 8112	0.226 8926	0.226 4059
23	232	56	43.8	1 35 43.8	2 9.9	1 19	20.0		5 13.6	9.859 9726	0.225 9083	0.225 4000
25	236	8	6.4	1 35 38.9	1 55.0	1 8	46.0		5 20.2	9.860 1319	0.224 8807	0.224 3504
27	239	19	19.2	1 35 34.1	1 38.8	0 57	59.7		5 25.9	9.860 2886	0.223 8091	0.223 2571
29	242	30	22.5	1 35 29.4	1 21.3	0 47	3.1		5 30.5	9.860 4423	0.222 6941	0.222 1199
31	245	41	16.9	1 35 25.0	-1 2.9	+0 35	58.3		-5 34.1	9.860 5923	0.221 5347	0.220 9384
Nov. 2	248	52	2.7	1 35 20.8	0 43.7	0 24	47.2		5 36.7	9.860 7384	0.220 3309	0.219 7124
4	252	2	40.4	1 35 16.9	0 24.0	0 13	32.1		5 38.3	9.860 8801	0.219 0825	0.218 4412
6	255	13	10.4	1 35 13.2	-0 4.0	+0 2	14.9		5 38.8	9.861 0168	0.217 7886	0.217 1245
8	258	23	33.4	1 35 9.8	+0 16.0	-0 9	2.3		5 38.3	9.861 1483	0.216 4490	0.215 7620
10	261	33	49.7	1 35 6.6	+0 35.9	-0 20	17.5		-5 36.7	9.861 2741	0.215 0637	0.214 3542
12	264	44	0.1	1 35 3.8	0 55.3	0 31	28.5		5 34.1	9.861 3939	0.213 6336	0.212 9018
14	267	54	5.0	1 35 1.2	1 14.0	0 42	33.4		5 30.6	9.861 5073	0.212 1590	0.211 4052
16	271	4	5.1	1 34 58.9	1 31.8	0 53	30.2		5 26.0	9.861 6139	0.210 6404	0.209 8648
18	274	14	0.8	1 34 56.9	1 48.4	1 4	16.9		5 20.5	9.861 7134	0.209 0783	0.208 2810
20	277	23	52.9	1 34 55.2	+2 3.7	-1 14	51.5		-5 14.0	9.861 8055	0.207 4728	0.206 6539
22	280	33	41.8	1 34 53.8	2 17.6	1 25	12.1		5 6.5	9.861 8900	0.205 8242	0.204 9837
24	283	43	28.2	1 34 52.7	2 29.7	1 35	17.0		4 58.2	9.861 9666	0.204 1323	0.203 2697
26	286	53	12.6	1 34 51.8	2 40.0	1 45	4.3		4 48.9	9.862 0351	0.202 3961	0.201 5117
28	290	2	55.5	1 34 51.2	2 48.4	1 54	32.2		4 38.8	9.862 0953	0.200 6161	0.199 7090
30	293	12	37.6	1 34 50.9	+2 54.6	-2 3	39.1		-4 27.9	9.862 1469	0.198 7906	0.197 8609
Dec. 2	296	22	19.3	1 34 50.9	2 58.8	2 12	23.3		4 16.2	9.862 1899	0.196 9196	0.195 9665
4	299	32	1.2	1 34 51.0	3 0.8	2 20	43.2		4 3.7	9.862 2242	0.195 0016	0.194 0247
6	302	41	43.8	1 34 51.5	3 0.6	2 28	37.4		3 50.4	9.862 2496	0.193 0357	0.192 0345
8	305	51	27.4	1 34 52.1	2 58.2	2 36	4.4		3 36.5	9.862 2660	0.191 0212	0.189 9957
10	309	1	12.6	1 34 53.0	+2 53.7	-2 43	3.0		-3 21.9	9.862 2734	0.188 9579	0.187 9078
12	312	10	59.7	1 34 54.1	2 47.0	2 49	31.7		3 6.7	9.862 2718	0.186 8454	0.185 7708
14	315	20	49.2	1 34 55.4	2 38.3	2 55	29.6		2 51.0	9.862 2612	0.184 6840	0.183 5849
16	318	30	41.4	1 34 56.8	2 27.6	3 0	55.4		2 34.7	9.862 2416	0.182 4737	0.181 3503
18	321	40	36.6	1 34 58.4	2 15.2	3 5	48.2		2 18.0	9.862 2131	0.180 2146	0.179 0667
20	324	50	35.2	1 35 0.2	+2 1.1	-3 10	7.1		-2 0.8	9.862 1757	0.177 9062	0.176 7333
22	328	0	37.5	1 35 2.1	1 45.5	3 13	51.2		1 43.3	9.862 1296	0.175 5480	0.174 3504
24	331	10	43.7	1 35 4.2	1 28.6	3 16	59.9		1 25.4	9.862 0748	0.173 1401	0.171 9168
26	334	20	54.2	1 35 6.3	1 10.7	3 19	32.6		1 7.3	9.862 0117	0.170 6804	0.169 4311
28	337	31	9.0	1 35 8.6	0 51.9	3 21	28.8		0 48.9	9.861 9403	0.168 1685	0.166 8925
30	340	41	28.4	1 35 10.9	+0 32.4	-3 22	48.1		-0 30.3	9.861 8608	0.165 6030	0.164 2998
32	343	51	52.6	1 35 13.3	+0 12.5	-3 23	30.2		-0 11.7	9.861 7736	0.162 9826	0.161 6515

MARS.									
GREENWICH MEAN NOON.									
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
							At Date.	At Interme- diate Date.	
Jan. 0	187 7 53.2	27 3.30	-53.4	+1 13 52.7	-39.10	0.214 5811	0.275 2370	0.273 1355	
2	188 2 2.6	27 6.10	53.2	1 12 33.8	39.75	0.214 2010	0.271 0162	0.268 8792	
4	188 56 17.6	27 8.97	52.9	1 11 13.7	40.35	0.213 8114	0.266 7242	0.264 5510	
6	189 50 38.5	27 11.95	52.6	1 9 52.4	40.95	0.213 4124	0.262 3596	0.260 1498	
8	190 45 5.5	27 15.02	52.2	1 8 29.9	41.55	0.213 0042	0.257 9216	0.255 6751	
10	191 39 38.6	27 18.12	-51.8	+1 7 6.2	-42.15	0.212 5866	0.253 4101	0.251 1263	
12	192 34 18.0	27 21.30	51.3	1 5 41.4	42.77	0.212 1598	0.248 8236	0.246 5020	
14	193 29 3.9	27 24.58	50.8	1 4 15.3	43.32	0.211 7239	0.244 1617	0.241 8027	
16	194 23 56.4	27 27.98	50.2	1 2 48.1	43.87	0.211 2789	0.239 4251	0.237 0287	
18	195 18 55.8	27 31.43	49.5	1 1 19.8	44.45	0.210 8249	0.234 6136	0.232 1797	
20	196 14 2.0	27 34.90	-48.8	+0 59 50.3	-45.02	0.210 3620	0.229 7272	0.227 2560	
22	197 9 15.3	27 38.45	48.1	0 58 19.7	45.55	0.209 8902	0.224 7661	0.222 2574	
24	198 4 35.8	27 42.10	47.3	0 56 48.0	46.12	0.209 4096	0.219 7298	0.217 1833	
26	199 0 3.7	27 45.85	46.4	0 55 15.2	46.65	0.208 9204	0.214 6177	0.212 0331	
28	199 55 39.2	27 49.65	45.5	0 53 41.4	47.17	0.208 4225	0.209 4293	0.206 8062	
30	200 51 22.3	27 53.50	-44.6	+0 52 6.5	-47.70	0.207 9160	0.204 1635	0.201 5011	
Feb. 1	201 47 13.2	27 57.45	43.6	0 50 30.5	48.25	0.207 4011	0.198 8188	0.196 1166	
3	202 43 12.1	28 1.47	42.5	0 48 53.5	48.75	0.206 8778	0.193 3943	0.190 6518	
5	203 39 19.1	28 5.57	41.4	0 47 15.5	49.25	0.206 3462	0.187 8888	0.185 1052	
7	204 35 34.4	28 9.75	40.3	0 45 36.5	49.75	0.205 8065	0.182 3010	0.179 4759	
9	205 31 58.1	28 14.00	-39.1	+0 43 56.5	-50.25	0.205 2586	0.176 6301	0.173 7636	
11	206 28 30.4	28 18.32	37.9	0 42 15.5	50.70	0.204 7028	0.170 8762	0.167 9679	
13	207 25 11.4	28 22.70	36.6	0 40 33.6	51.20	0.204 1391	0.165 0388	0.162 0889	
15	208 22 1.2	28 27.18	35.3	0 38 50.7	51.67	0.203 5676	0.159 1183	0.156 1269	
17	209 19 0.1	28 31.72	33.9	0 37 6.9	52.10	0.202 9884	0.153 1148	0.150 0819	
19	210 16 8.1	28 36.37	-32.5	+0 35 22.3	-52.57	0.202 4016	0.147 0282	0.143 9537	
21	211 13 25.4	28 41.03	31.0	0 33 36.8	52.97	0.201 8074	0.140 8583	0.137 7422	
23	212 10 52.2	28 45.80	29.6	0 31 50.4	53.40	0.201 2059	0.134 6050	0.131 4466	
25	213 8 28.6	28 50.60	28.1	0 30 3.2	53.82	0.200 5972	0.128 2671	0.125 0662	
27	214 6 14.6	28 55.50	26.5	0 28 15.1	54.22	0.199 9814	0.121 8437	0.118 5995	
Mar. 1	215 4 10.6	29 0.52	-24.9	+0 26 26.3	-54.60	0.199 3586	0.115 3335	0.112 0454	
3	216 2 16.5	29 5.57	23.3	0 24 36.7	54.97	0.198 7290	0.108 7351	0.105 4024	
5	217 0 32.6	29 10.62	21.6	0 22 46.4	55.32	0.198 0928	0.102 0472	0.098 6692	
7	217 58 59.0	29 15.82	19.9	0 20 55.4	55.70	0.197 4500	0.095 2684	0.091 8444	
9	218 57 35.9	29 21.07	18.2	0 19 3.6	56.05	0.196 8007	0.088 3974	0.084 9274	
11	219 56 23.3	29 26.35	-16.5	+0 17 11.2	-56.35	0.196 1452	0.081 4344	0.077 9182	
13	220 55 21.3	29 31.70	14.7	0 15 18.2	56.67	0.195 4836	0.074 3789	0.070 8169	
15	221 54 30.2	29 37.20	12.9	0 13 24.5	57.00	0.194 8161	0.067 2319	0.063 6239	
17	222 53 50.1	29 42.70	11.1	0 11 30.2	57.27	0.194 1427	0.059 9932	0.056 3399	
19	223 53 21.0	29 48.28	9.3	0 9 35.4	57.52	0.193 4638	0.052 6639	0.048 9652	
21	224 53 3.2	29 53.95	-7.4	+0 7 40.1	-57.80	0.192 7793	0.045 2440	0.041 4999	
23	225 52 56.8	29 59.65	5.6	0 5 44.2	58.07	0.192 0896	0.037 7331	0.033 9434	
25	226 53 1.8	30 5.40	3.7	0 3 47.8	58.30	0.191 3947	0.030 1308	0.026 2951	
27	227 53 18.4	30 11.22	-1.8	+0 1 51.0	58.47	0.190 6948	0.022 4364	0.018 5546	
29	228 53 46.7	30 17.10	+0.1	-0 0 6.1	58.67	0.189 9902	0.014 6494	0.010 7207	
31	229 54 26.8	30 23.00	+2.0	-0 2 3.7	-58.87	0.189 2811	0.006 7683	0.002 7922	
Apr. 2	230 55 18.8	30 29.05	+3.9	-0 4 1.6	-59.05	0.188 5675	9.998 7922	9.994 7679	



## MARS.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
							At Date.	At Intermediate Date.	
Apr.	2 230 55 18.8	30 29.05	+ 3.9	— 0 4 1.6	— 59.05	0.188 5675	9.998 7922	9.994 7679	
	4 231 56 23.0	30 35.12	5.8	0 5 59.9	59.20	0.187 8497	9.990 7194	9.986 6468	
	6 232 57 39.3	30 41.23	7.7	0 7 58.4	59.30	0.187 1279	9.982 5501	9.978 4294	
	8 233 59 7.9	30 47.40	9.6	0 9 57.1	59.42	0.186 4024	9.974 2848	9.970 1164	
	10 235 0 48.9	30 53.62	11.5	0 11 56.1	59.52	0.185 6732	9.965 9244	9.961 7092	
	12 236 2 42.4	30 59.88	+ 13.4	— 0 13 55.2	— 59.60	0.184 9406	9.957 4710	9.953 2099	
	14 237 4 48.4	31 6.15	15.3	0 15 54.5	59.65	0.184 2049	9.948 9263	9.944 6204	
	16 238 7 7.1	31 12.55	17.1	0 17 53.8	59.67	0.183 4663	9.940 2926	9.935 9433	
	18 239 9 38.6	31 19.00	19.0	0 19 53.2	59.72	0.182 7250	9.931 5726	9.927 1806	
	20 240 12 23.1	31 25.47	20.8	0 21 52.7	59.72	0.181 9811	9.922 7677	9.918 3340	
	22 241 15 20.5	31 31.95	+ 22.6	— 0 23 52.1	— 59.65	0.181 2351	9.913 8800	9.909 4058	
	24 242 18 30.9	31 38.50	24.4	0 25 51.4	59.62	0.180 4870	9.904 9116	9.900 3978	
	26 243 21 54.5	31 45.07	26.1	0 27 50.6	59.57	0.179 7371	9.895 8645	9.891 3117	
	28 244 25 31.2	31 51.70	27.8	0 29 49.7	59.47	0.178 9858	9.886 7399	9.882 1492	
	30 245 29 21.3	31 58.37	29.5	0 31 48.5	59.35	0.178 2331	9.877 5401	9.872 9126	
	May	2 246 33 24.7	32 5.05	+ 31.2	— 0 33 47.1	— 59.22	0.177 4795	9.868 2676	9.863 6053
		4 247 37 41.5	32 11.77	32.8	0 35 45.4	59.07	0.176 7251	9.858 9264	9.854 2315
		6 248 42 11.7	32 18.50	34.4	0 37 43.4	58.85	0.175 9702	9.849 5217	9.844 7978
		8 249 46 55.6	32 25.30	35.9	0 39 41.0	58.67	0.175 2151	9.840 0610	9.835 3122
		10 250 51 53.0	32 32.10	37.4	0 41 38.1	58.42	0.174 4601	9.830 5527	9.825 7840
12 251 57 4.0		32 38.90	+ 38.8	— 0 43 34.7	— 58.17	0.173 7054	9.821 0072	9.816 2233	
14 253 2 28.6		32 45.75	40.2	0 45 30.8	57.90	0.172 9514	9.811 4338	9.806 6403	
16 254 8 7.0		32 52.62	41.5	0 47 26.3	57.60	0.172 1982	9.801 8442	9.797 0471	
18 255 13 59.1		32 59.50	42.8	0 49 21.2	57.27	0.171 4463	9.792 2505	9.787 4557	
20 256 20 5.0		33 6.37	44.0	0 51 15.4	56.90	0.170 6958	9.782 6646	9.777 8790	
	22 257 26 24.6	33 13.26	+ 45.2	— 0 53 8.8	— 56.50	0.169 9471	9.773 1011	9.768 3320	
	24 258 32 58.1	33 20.16	46.3	0 55 1.4	56.10	0.169 2005	9.763 5739	9.758 8285	
	26 259 39 45.3	33 27.05	47.3	0 56 53.2	55.67	0.168 4564	9.754 0978	9.749 3836	
	28 260 46 46.4	33 33.92	48.3	0 58 44.1	55.20	0.167 7149	9.744 6884	9.740 0141	
	30 261 54 1.2	33 40.80	49.2	1 0 34.0	54.70	0.166 9765	9.735 3637	9.730 7399	
	June	1 263 1 29.8	33 47.75	+ 50.0	— 1 2 22.9	— 54.17	0.166 2414	9.726 1458	9.721 5844
		3 264 9 12.2	33 54.65	50.7	1 4 10.7	53.60	0.165 5099	9.717 0591	9.712 5729
		5 265 17 8.4	34 1.52	51.4	1 5 57.3	53.02	0.164 7825	9.708 1299	9.703 7338
		7 266 25 18.3	34 8.35	52.0	1 7 42.8	52.42	0.164 0593	9.699 3886	9.695 0980
		9 267 33 41.8	34 15.18	52.5	1 9 27.0	51.75	0.163 3408	9.690 8662	9.686 6973
11 268 42 19.0		34 22.00	+ 52.9	— 1 11 9.8	— 51.05	0.162 6272	9.682 5959	9.678 5665	
13 269 51 9.7		34 28.77	53.3	1 12 51.3	50.40	0.161 9190	9.674 6129	9.670 7390	
15 271 0 14.0		34 35.52	53.5	1 14 31.4	49.67	0.161 2163	9.666 9492	9.663 2481	
17 272 9 31.8		34 42.27	53.7	1 16 10.0	48.92	0.160 5197	9.659 6398	9.656 1289	
19 273 19 3.0		34 48.92	53.8	1 17 47.1	48.12	0.159 8293	9.652 7190	9.649 4140	
	21 274 28 47.4	34 55.50	+ 53.8	— 1 19 22.5	— 47.30	0.159 1456	9.646 2181	9.643 1352	
	23 275 38 45.0	35 2.10	53.7	1 20 56.3	46.45	0.158 4689	9.640 1688	9.637 3224	
	25 276 48 55.8	35 8.65	53.5	1 22 28.3	45.57	0.157 7995	9.634 5997	9.632 0042	
	27 277 59 19.6	35 15.12	53.2	1 23 58.6	44.67	0.157 1377	9.629 5395	9.627 2090	
	29 279 9 56.3	35 21.55	52.9	1 25 27.1	43.72	0.156 4840	9.625 0162	9.622 9647	
	July	1 280 20 45.8	35 27.88	+ 52.4	— 1 26 53.5	— 42.75	0.155 8386	9.621 0573	9.619 2975
		3 281 31 47.9	35 34.12	+ 51.9	— 1 28 18.0	— 41.75	0.155 2019	9.617 6876	9.616 2300

MARS.								
GREENWICH MEAN NOON.								
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Interme- diate Date.
July 1	280 20 45.8	35 27.88	+ 52.4	— 1 26 53.5	— 42.75	0.155 8386	9.621 0573	9.619 2975
3	281 31 47.9	35 34.12	51.9	1 28 18.0	41.75	0.155 2019	9.617 6876	9.616 2300
5	282 43 2.5	35 40.35	51.2	1 29 40.5	40.72	0.154 5742	9.614 9270	9.613 7810
7	283 54 29.4	35 46.55	50.5	1 31 0.9	39.67	0.153 9559	9.612 7929	9.611 9641
9	285 6 8.8	35 52.65	49.7	1 32 19.2	38.60	0.153 3473	9.611 2948	9.610 7858
11	286 18 0.1	35 58.62	+ 48.8	— 1 33 35.3	— 37.47	0.152 7487	9.610 4364	9.610 2467
13	287 30 3.3	36 4.50	47.8	1 34 49.1	36.32	0.152 1605	9.610 2151	9.610 3406
15	288 42 18.1	36 10.30	46.7	1 36 0.6	35.17	0.151 5830	9.610 6211	9.611 0558
17	289 54 44.5	36 16.02	45.5	1 37 9.8	33.97	0.151 0166	9.611 6414	9.612 3757
19	291 7 22.2	36 21.64	44.3	1 38 16.5	32.75	0.150 4615	9.613 2553	9.614 2769
21	292 20 11.0	36 27.14	+ 43.0	— 1 39 20.8	— 31.50	0.149 9181	9.615 4372	9.616 7331
23	293 33 10.7	36 32.54	41.6	1 40 22.5	30.25	0.149 3868	9.618 1608	9.619 7165
25	294 46 21.1	36 37.83	40.1	1 41 21.7	29.00	0.148 8678	9.621 3967	9.623 1976
27	295 59 42.0	36 43.02	38.5	1 42 18.3	27.65	0.148 3615	9.625 1156	9.627 1471
29	297 13 13.1	36 48.05	36.8	1 43 12.2	26.25	0.147 8681	9.629 2885	9.631 5365
31	298 26 54.1	36 52.94	+ 35.2	— 1 44 3.3	— 24.85	0.147 3879	9.633 8869	9.636 3360
Aug. 2	299 40 44.8	36 57.75	33.4	1 44 51.7	23.50	0.146 9213	9.638 8799	9.641 5150
4	300 54 45.0	37 2.42	31.5	1 45 37.3	22.07	0.146 4685	9.644 2370	9.647 0417
6	302 8 54.4	37 6.94	29.6	1 46 20.0	20.62	0.146 0298	9.649 9253	9.652 8841
8	303 23 12.7	37 11.32	27.6	1 46 59.8	19.20	0.145 6056	9.655 9140	9.659 0111
10	304 37 39.6	37 15.55	+ 25.6	— 1 47 36.8	— 17.72	0.145 1960	9.662 1714	9.665 3910
12	305 52 14.8	37 19.62	23.5	1 48 10.7	16.22	0.144 8013	9.668 6656	9.671 9924
14	307 6 58.0	37 23.57	21.4	1 48 41.7	14.72	0.144 4219	9.675 3675	9.678 7871
16	308 21 49.0	37 27.37	19.2	1 49 9.6	13.17	0.144 0579	9.682 2481	9.685 7469
18	309 36 47.4	37 31.00	17.0	1 49 34.4	11.65	0.143 7095	9.689 2807	9.692 8464
20	310 51 52.9	37 34.45	+ 14.8	— 1 49 56.2	— 10.10	0.143 3771	9.696 4416	9.700 0635
22	312 7 5.1	37 37.75	12.5	1 50 14.8	8.52	0.143 0608	9.703 7101	9.707 3787
24	313 22 23.8	37 40.90	10.2	1 50 30.3	6.97	0.142 7608	9.711 0680	9.714 7761
26	314 37 48.6	37 43.85	7.9	1 50 42.7	5.37	0.142 4773	9.718 5014	9.722 2419
28	315 53 19.1	37 46.62	5.6	1 50 51.8	3.77	0.142 2106	9.725 9968	9.729 7641
30	317 8 55.0	37 49.25	+ 3.2	— 1 50 57.8	— 2.17	0.141 9608	9.733 5425	9.737 3305
Sept. 1	318 24 36.0	37 51.70	+ 0.8	1 51 0.5	— 0.55	0.141 7280	9.741 1268	9.744 9301
3	319 40 21.7	37 53.95	— 1.6	1 51 0.0	+ 1.05	0.141 5126	9.748 7392	9.752 5527
5	320 56 11.7	37 56.00	3.9	1 50 56.3	2.67	0.141 3145	9.756 3693	9.760 1877
7	322 12 5.6	37 57.88	6.3	1 50 49.3	4.30	0.141 1339	9.764 0069	9.767 8257
9	323 28 3.1	37 59.60	— 8.6	— 1 50 39.1	+ 5.92	0.140 9709	9.771 6431	9.775 4578
11	324 44 3.9	38 1.13	11.0	1 50 25.6	7.57	0.140 8258	9.779 2689	9.783 0758
13	326 0 7.5	38 2.46	13.3	1 50 8.8	9.17	0.140 6984	9.786 8769	9.790 6715
15	327 16 13.6	38 3.58	15.6	1 49 48.9	10.77	0.140 5891	9.794 4591	9.798 2389
17	328 32 21.7	38 4.51	17.8	1 49 25.7	12.40	0.140 4977	9.802 0104	9.805 7732
19	329 48 31.5	38 5.26	— 20.1	— 1 48 59.2	+ 14.00	0.140 4244	9.809 5269	9.813 2712
21	331 4 42.6	38 5.83	22.3	1 48 29.6	15.62	0.140 3693	9.817 0060	9.820 7309
23	332 20 54.7	38 6.21	24.4	1 47 56.7	17.22	0.140 3324	9.824 4459	9.828 1510
25	333 37 7.3	38 6.38	26.5	1 47 20.7	18.80	0.140 3136	9.831 8463	9.835 5319
27	334 53 20.1	38 6.35	28.6	1 46 41.5	20.40	0.140 3131	9.839 2075	9.842 8727
29	336 9 32.6	38 6.13	— 30.6	— 1 45 59.1	+ 21.95	0.140 3308	9.846 5276	9.850 1722
Oct. 1	337 25 44.5	38 5.73	— 32.5	— 1 45 13.7	+ 23.50	0.140 3666	9.853 8062	9.857 4292

## MARS.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
Oct. 1	337	25	44.5	38 5.73	-32.5	-1 45	13.7		+23.50	0.140 3666	9.853 8062	9.857 4292
3	338	41	55.4	38 5.13	34.4	1 44	25.1		25.05	0.140 4207	9.861 0412	9.864 6424
5	339	58	4.9	38 4.33	36.2	1 43	33.5		26.55	0.140 4929	9.868 2323	9.871 8105
7	341	14	12.6	38 3.33	37.9	1 42	38.9		28.07	0.140 5832	9.875 3768	9.878 9314
9	342	30	18.1	38 2.16	39.5	1 41	41.2		29.57	0.140 6916	9.882 4737	9.886 0032
11	343	46	21.1	38 0.80	-41.1	-1 40	40.6		+31.02	0.140 8178	9.889 5200	9.893 0239
13	345	2	21.2	37 59.25	42.6	1 39	37.1		32.45	0.140 9620	9.896 5148	9.899 9923
15	346	18	18.0	37 57.50	44.0	1 38	30.8		33.87	0.141 1239	9.903 4565	9.906 9074
17	347	34	11.1	37 55.58	45.3	1 37	21.6		35.30	0.141 3034	9.910 3451	9.913 7699
19	348	50	0.2	37 53.48	46.6	1 36	9.6		36.67	0.141 5005	9.917 1817	9.920 5804
21	350	5	44.9	37 51.18	-47.7	-1 34	54.9		+38.02	0.141 7150	9.923 9664	9.927 3402
23	351	21	24.8	37 48.70	48.7	1 33	37.5		39.35	0.141 9467	9.930 7018	9.934 0514
25	352	36	59.6	37 46.05	49.7	1 32	17.5		40.65	0.142 1953	9.937 3890	9.940 7149
27	353	52	29.0	37 43.25	50.6	1 30	54.9		41.97	0.142 4613	9.944 0292	9.947 3318
29	355	7	52.5	37 40.25	51.3	1 29	29.7		43.17	0.142 7437	9.950 6228	9.953 9024
31	356	23	9.9	37 37.10	-52.0	-1 28	2.1		+44.40	0.143 0427	9.957 1703	9.960 4267
Nov. 2	357	38	20.8	37 33.78	52.5	1 26	32.2		45.57	0.143 3581	9.963 6715	9.966 9048
4	358	53	24.9	37 30.28	53.0	1 24	59.9		46.70	0.143 6896	9.970 1264	9.973 3361
6	0	8	21.8	37 26.63	53.3	1 23	25.3		47.85	0.144 0371	9.976 5340	9.979 7199
8	1	23	11.3	37 22.85	53.6	1 21	48.5		48.95	0.144 4001	9.982 8937	9.986 0551
10	2	37	53.1	37 18.87	-53.7	-1 20	9.5		+50.02	0.144 7786	9.989 2042	9.992 3407
12	3	52	26.7	37 14.77	53.8	1 18	28.4		51.05	0.145 1723	9.995 4648	9.998 5764
14	5	6	52.0	37 10.53	53.7	1 16	45.3		52.02	0.145 5810	0.001 6756	0.004 7626
16	6	21	8.7	37 6.12	53.6	1 15	0.3		52.97	0.146 0044	0.007 8374	0.010 9000
18	7	35	16.4	37 1.59	53.3	1 13	13.4		53.90	0.146 4421	0.013 9508	0.016 9900
20	8	49	15.0	36 56.94	-53.0	-1 11	24.7		+54.80	0.146 8941	0.020 0176	0.023 0339
22	10	3	4.1	36 52.16	52.5	1 9	34.2		55.67	0.147 3598	0.026 0388	0.029 0325
24	11	16	43.4	36 47.20	52.0	1 7	42.0		56.50	0.147 8392	0.032 0151	0.034 9867
26	12	30	12.8	36 42.14	51.4	1 5	48.2		57.25	0.148 3318	0.037 9474	0.040 8973
28	13	43	31.9	36 36.97	50.6	1 3	52.9		58.02	0.148 8373	0.043 8362	0.046 7642
30	14	56	40.6	36 31.69	-49.8	-1 1	56.1		+58.72	0.149 3555	0.049 6814	0.052 5877
Dec. 2	16	9	38.6	36 26.29	48.9	0 59	58.0		59.40	0.149 8861	0.055 4830	0.058 3674
4	17	22	25.7	36 20.79	47.9	0 57	58.5		60.05	0.150 4287	0.061 2406	0.064 1025
6	18	35	1.7	36 15.19	46.8	0 55	57.8		60.67	0.150 9830	0.066 9529	0.069 7917
8	19	47	26.4	36 9.49	45.7	0 53	55.8		61.27	0.151 5487	0.072 6189	0.075 4345
10	20	59	39.6	36 3.71	-44.4	-0 51	52.7		+61.77	0.152 1255	0.078 2383	0.081 0300
12	22	11	41.2	35 57.83	43.1	0 49	48.7		62.25	0.152 7130	0.083 8098	0.086 5779
14	23	23	30.9	35 51.84	41.7	0 47	43.7		62.75	0.153 3108	0.089 3343	0.092 0791
16	24	35	8.5	35 45.78	40.3	0 45	37.7		63.17	0.153 9188	0.094 8124	0.097 5342
18	25	46	34.0	35 39.66	38.8	0 43	31.0		63.57	0.154 5364	0.100 2447	0.102 9440
20	26	57	47.1	35 33.46	-37.2	-0 41	23.5		+63.95	0.155 1634	0.105 6321	0.108 3091
22	28	8	47.8	35 27.21	35.6	0 39	15.2		64.25	0.155 7995	0.110 9750	0.113 6301
24	29	19	35.9	35 20.88	33.9	0 37	6.4		64.55	0.156 4443	0.116 2743	0.118 9078
26	30	30	11.3	35 14.48	32.1	0 34	57.0		64.82	0.157 0975	0.121 5304	0.124 1421
28	31	40	33.8	35 8.01	30.3	0 32	47.1		65.05	0.157 7586	0.126 7430	0.129 3330
30	32	50	43.3	35 1.51	-28.5	-0 30	36.8		+65.22	0.158 4275	0.131 9122	0.134 4806
32	34	0	39.8	34 54.96	-26.6	-0 28	26.2		+65.40	0.159 1037	0.137 0380	0.139 5841

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GREENWICH MEAN NOON.									
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
							At Date.	At Interme- diate Date.	
Jan. 2	96 25 4.0	5 3.35	— 2.9	— 0 4 12.4	+ 6.92	0.712 9789	0.621 6449	0.622 1109	
6	96 45 17.1	5 3.18	2.6	0 3 44.8	6.92	0.713 1006	0.622 7060	0.623 4290	
10	97 5 29.5	5 3.01	2.3	0 3 17.1	6.91	0.713 2224	0.624 2797	0.625 2548	
14	97 25 41.2	5 2.84	1.9	0 2 49.5	6.91	0.713 3442	0.626 3517	0.627 5682	
18	97 45 52.2	5 2.67	1.6	0 2 21.8	6.91	0.713 4660	0.628 9003	0.630 3445	
22	98 6 2.6	5 2.50	— 1.3	— 0 1 54.2	+ 6.91	0.713 5878	0.631 8966	0.633 5527	
26	98 26 12.3	5 2.33	1.0	0 1 26.5	6.90	0.713 7096	0.635 3083	0.637 1592	
30	98 46 21.3	5 2.16	0.7	0 0 58.9	6.90	0.713 8314	0.639 1011	0.641 1297	
Feb. 3	99 6 29.6	5 1.99	0.4	0 0 31.3	6.90	0.713 9533	0.643 2403	0.645 4284	
7	99 26 37.2	5 1.82	— 0.1	— 0 0 3.7	6.90	0.714 0752	0.647 6897	0.650 0206	
11	99 46 44.2	5 1.65	+ 0.2	+ 0 0 23.9	+ 6.89	0.714 1971	0.652 4153	0.654 8686	
15	100 6 50.5	5 1.48	0.5	0 0 51.4	6.89	0.714 3190	0.657 3759	0.659 9324	
19	100 26 56.1	5 1.31	0.8	0 1 19.0	6.88	0.714 4409	0.662 5332	0.665 1730	
23	100 47 1.0	5 1.15	1.1	0 1 46.5	6.88	0.714 5628	0.667 8477	0.670 5529	
27	101 7 5.2	5 0.98	1.4	0 2 14.0	6.87	0.714 6847	0.673 2845	0.676 0383	
Mar. 3	101 27 8.8	5 0.81	+ 1.7	+ 0 2 41.5	+ 6.87	0.714 8066	0.678 8106	0.681 5977	
7	101 47 11.7	5 0.64	2.0	0 3 8.9	6.86	0.714 9285	0.684 3961	0.687 2021	
11	102 7 13.9	5 0.47	2.3	0 3 36.4	6.86	0.715 0503	0.690 0124	0.692 8235	
15	102 27 15.4	5 0.30	2.7	0 4 3.8	6.85	0.715 1721	0.695 6319	0.698 4339	
19	102 47 16.3	5 0.13	3.0	0 4 31.2	6.84	0.715 2939	0.701 2266	0.704 0068	
23	103 7 16.5	4 59.96	+ 3.3	+ 0 4 58.6	+ 6.84	0.715 4156	0.706 7721	0.709 5194	
27	103 27 16.1	4 59.79	3.6	0 5 25.9	6.83	0.715 5373	0.712 2468	0.714 9322	
31	103 47 14.9	4 59.62	3.9	0 5 53.2	6.83	0.715 6590	0.717 6335	0.720 2886	
Apr. 4	104 7 13.1	4 59.46	4.3	0 6 20.5	6.82	0.715 7806	0.722 9159	0.725 5135	
8	104 27 10.6	4 59.29	4.6	0 6 47.8	6.81	0.715 9021	0.728 0796	0.730 6125	
12	104 47 7.5	4 59.13	+ 4.9	+ 0 7 15.0	+ 6.80	0.716 0236	0.733 1105	0.735 5715	
16	105 7 3.6	4 58.96	5.2	0 7 42.2	6.79	0.716 1450	0.737 9942	0.740 3769	
20	105 26 59.1	4 58.80	5.5	0 8 9.4	6.79	0.716 2664	0.742 7187	0.745 0183	
24	105 46 54.0	4 58.63	5.8	0 8 36.5	6.78	0.716 3878	0.747 2749	0.749 4872	
28	106 6 48.2	4 58.46	6.1	0 9 3.6	6.77	0.716 5091	0.751 6548	0.753 7770	
May 2	106 26 41.7	4 58.30	+ 6.4	+ 0 9 30.7	+ 6.76	0.716 6302	0.755 8532	0.757 8829	
6	106 46 34.5	4 58.13	6.7	0 9 57.8	6.75	0.716 7512	0.759 8650	0.761 7985	
10	107 6 26.7	4 57.97	7.0	0 10 24.8	6.74	0.716 8722	0.763 6828	0.765 5171	
14	107 26 18.2	4 57.80	7.3	0 10 51.7	6.73	0.716 9931	0.767 3008	0.769 0330	
18	107 46 9.1	4 57.63	7.6	0 11 18.7	6.73	0.717 1139	0.770 7136	0.772 3421	
22	108 5 59.3	4 57.47	+ 7.9	+ 0 11 45.6	+ 6.72	0.717 2346	0.773 9181	0.775 4412	
26	108 25 48.9	4 57.30	8.2	0 12 12.4	6.71	0.717 3552	0.776 9115	0.778 3290	
30	108 45 37.7	4 57.14	8.5	0 12 39.2	6.70	0.717 4757	0.779 6935	0.781 0048	
June 3	109 5 25.9	4 56.97	8.8	0 13 6.0	6.69	0.717 5960	0.782 2625	0.783 4662	
7	109 25 13.5	4 56.81	9.1	0 13 32.8	6.68	0.717 7162	0.784 6155	0.785 7099	
11	109 45 0.4	4 56.64	+ 9.4	+ 0 13 59.5	+ 6.67	0.717 8363	0.786 7494	0.787 7336	
15	110 4 46.7	4 56.48	9.7	0 14 26.1	6.66	0.717 9563	0.788 6624	0.789 5358	
19	110 24 32.3	4 56.32	10.0	0 14 52.7	6.65	0.718 0762	0.790 3536	0.791 1156	
23	110 44 17.3	4 56.16	10.3	0 15 19.3	6.64	0.718 1961	0.791 8222	0.792 4736	
27	111 4 1.6	4 55.99	10.6	0 15 45.8	6.63	0.718 3158	0.793 0698	0.793 6108	
July 1	111 23 45.2	4 55.83	+ 10.9	+ 0 16 12.3	+ 6.62	0.718 4353	0.794 0963	0.794 3459	
5	111 43 28.2	4 55.67	+ 11.2	+ 0 16 38.7	+ 6.61	0.718 5547	0.794 8995	0.795 2171	

## JUPITER.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
July 1	111	23	45.2	4 55.83	+ 10.9	+ 0	16	12.3	+ 6.62	0.718 4353	0.794 0963	0.794 5259
5	111	43	28.2	4 55.67	11.2	0	16	38.7	6.61	0.718 5547	0.794 8995	0.795 2171
9	112	3	10.6	4 55.51	11.5	0	17	5.1	6.60	0.718 6739	0.795 4784	0.795 6832
13	112	22	52.3	4 55.35	11.7	0	17	31.4	6.58	0.718 7930	0.795 8315	0.795 9235
17	112	42	33.4	4 55.19	12.0	0	17	57.7	6.57	0.718 9120	0.795 9590	0.795 9385
21	113	2	13.8	4 55.03	+ 12.3	+ 0	18	24.0	+ 6.56	0.719 0308	0.795 8618	0.795 7295
25	113	21	53.6	4 54.87	12.5	0	18	50.1	6.54	0.719 1494	0.795 5411	0.795 2974
29	113	41	32.8	4 54.71	12.8	0	19	16.3	6.53	0.719 2678	0.794 9979	0.794 6426
Aug. 2	114	1	11.3	4 54.55	13.0	0	19	42.3	6.51	0.719 3861	0.794 2315	0.793 7640
6	114	20	49.1	4 54.39	13.3	0	20	8.4	6.50	0.719 5043	0.793 2405	0.792 6607
10	114	40	26.4	4 54.23	+ 13.6	+ 0	20	34.4	+ 6.49	0.719 6223	0.792 0248	0.791 3331
14	115	0	3.0	4 54.07	13.9	0	21	0.3	6.47	0.719 7401	0.790 5853	0.789 7824
18	115	19	38.9	4 53.91	14.2	0	21	26.1	6.46	0.719 8577	0.788 9236	0.788 0107
22	115	39	14.2	4 53.75	14.4	0	21	52.0	6.44	0.719 9751	0.787 0425	0.786 0204
26	115	58	48.9	4 53.59	14.7	0	22	17.7	6.43	0.720 0923	0.784 9437	0.783 8128
30	116	18	23.0	4 53.43	+ 14.9	+ 0	22	43.4	+ 6.42	0.720 2093	0.782 6276	0.781 3881
Sept. 3	116	37	56.4	4 53.27	15.2	0	23	9.1	6.40	0.720 3261	0.780 0945	0.778 7469
7	116	57	29.2	4 53.11	15.4	0	23	34.6	6.39	0.720 4428	0.777 3459	0.775 8918
11	117	17	1.4	4 52.96	15.6	0	24	0.2	6.37	0.720 5593	0.774 3851	0.772 8262
15	117	36	32.9	4 52.80	15.9	0	24	25.6	6.36	0.720 6756	0.771 2159	0.769 5550
19	117	56	3.9	4 52.65	+ 16.1	+ 0	24	51.0	+ 6.34	0.720 7916	0.767 8441	0.766 0837
23	118	15	34.2	4 52.49	16.4	0	25	16.4	6.33	0.720 9074	0.764 2742	0.762 4161
27	118	35	3.8	4 52.34	16.6	0	25	41.6	6.31	0.721 0230	0.760 5103	0.758 5569
Oct. 1	118	54	32.9	4 52.19	16.8	0	26	6.8	6.29	0.721 1384	0.756 5567	0.754 5104
5	119	14	1.3	4 52.03	17.1	0	26	32.0	6.28	0.721 2536	0.752 4191	0.750 2839
9	119	33	29.1	4 51.88	+ 17.3	+ 0	26	57.1	+ 6.26	0.721 3685	0.748 1059	0.745 8862
13	119	52	56.4	4 51.72	17.6	0	27	22.1	6.25	0.721 4832	0.743 6267	0.741 3289
17	120	12	23.0	4 51.57	17.8	0	27	47.1	6.23	0.721 5977	0.738 9941	0.736 6237
21	120	31	49.0	4 51.42	18.0	0	28	12.0	6.21	0.721 7120	0.734 2192	0.731 7820
25	120	51	14.4	4 51.26	18.3	0	28	36.8	6.20	0.721 8261	0.729 3138	0.726 8159
29	121	10	39.1	4 51.11	+ 18.5	+ 0	29	1.5	+ 6.18	0.721 9399	0.724 2905	0.721 7393
Nov. 2	121	30	3.3	4 50.96	18.7	0	29	26.2	6.17	0.722 0534	0.719 1647	0.716 5690
6	121	49	26.8	4 50.81	18.9	0	29	50.8	6.15	0.722 1666	0.713 9549	0.711 3250
10	122	8	49.8	4 50.66	19.1	0	30	15.4	6.13	0.722 2796	0.708 6824	0.706 0305
14	122	28	12.1	4 50.51	19.3	0	30	39.9	6.11	0.722 3924	0.703 3717	0.700 7086
18	122	47	33.9	4 50.36	+ 19.5	+ 0	31	4.3	+ 6.09	0.722 5049	0.698 0448	0.695 3837
22	123	6	55.1	4 50.21	19.7	0	31	28.6	6.07	0.722 6172	0.692 7279	0.690 0808
26	123	26	15.6	4 50.06	19.9	0	31	52.8	6.05	0.722 7292	0.687 4462	0.684 8276
30	123	45	35.6	4 49.92	20.1	0	32	17.0	6.04	0.722 8409	0.682 2294	0.679 6553
Dec. 4	124	4	55.0	4 49.77	20.3	0	32	41.1	6.02	0.722 9523	0.677 1103	0.674 5986
8	124	24	13.7	4 49.62	+ 20.5	+ 0	33	5.2	+ 6.00	0.723 0635	0.672 1247	0.669 6932
12	124	43	31.9	4 49.47	20.7	0	33	29.2	5.98	0.723 1744	0.667 3087	0.664 9761
16	125	2	49.5	4 49.32	20.9	0	33	53.0	5.96	0.723 2850	0.662 6994	0.660 4825
20	125	22	6.6	4 49.18	21.1	0	34	16.9	5.94	0.723 3954	0.658 3301	0.656 2466
24	125	41	23.0	4 49.03	21.3	0	34	40.6	5.93	0.723 5055	0.654 2368	0.652 3055
28	126	0	38.8	4 48.89	+ 21.5	+ 0	35	4.2	+ 5.91	0.723 6153	0.650 4569	0.648 6956
32	126	19	54.1	4 48.74	+ 21.7	+ 0	35	27.8	+ 5.89	0.723 7248	0.647 0254	. . .

SATURN.												
GREENWICH MEAN NOON.												
Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
											At Date.	At Intermediate Date.
Jan.	2	345	31 18.9	1 57.55	+ 1 34.1	- 1 58	47.8	- 3.10	0.984 8073	1.005 0715	1.006 2840	
	6	345	39 9.2	1 57.58	1 34.0	1 59	0.2	3.09	0.984 7536	1.007 4686	1.008 6242	
	10	345	46 59.6	1 57.61	1 33.8	1 59	12.6	3.08	0.984 6999	1.009 7499	1.010 8450	
	14	345	54 50.1	1 57.65	1 33.7	1 59	24.9	3.07	0.984 6461	1.011 9082	1.012 9384	
	18	346	2 40.7	1 57.68	1 33.6	1 59	37.2	3.06	0.984 5923	1.013 9350	1.014 8971	
	22	346	10 31.5	1 57.70	+ 1 33.5	- 1 59	49.4	- 3.06	0.984 5385	1.015 8243	1.016 7158	
	26	346	18 22.4	1 57.73	1 33.4	2 0	1.6	3.05	0.984 4846	1.017 5713	1.018 3903	
	30	346	26 13.3	1 57.76	1 33.3	2 0	13.8	3.04	0.984 4307	1.019 1724	1.019 9169	
	Feb. 3	346	34 4.4	1 57.79	1 33.1	2 0	25.9	3.03	0.984 3767	1.020 6235	1.021 2917	
		7	346	41 55.6	1 57.82	1 33.0	2 0	38.0	3.02	0.984 3227	1.021 9210	1.022 5110
	11	346	49 47.0	1 57.85	+ 1 32.8	- 2 0	50.1	- 3.02	0.984 2686	1.023 0613	1.023 5712	
	15	346	57 38.4	1 57.87	1 32.7	2 1	2.2	3.01	0.984 2146	1.024 0405	1.024 4690	
	19	347	5 30.0	1 57.90	1 32.6	2 1	14.2	3.00	0.984 1605	1.024 8564	1.025 2030	
	23	347	13 21.6	1 57.93	1 32.4	2 1	26.1	2.99	0.984 1064	1.025 5084	1.025 7726	
	27	347	21 13.4	1 57.96	1 32.3	2 1	38.1	2.98	0.984 0523	1.025 9955	1.026 1772	
Mar.	3	347	29 5.3	1 57.99	+ 1 32.1	- 2 1	50.0	- 2.97	0.983 9982	1.026 3176	1.026 4167	
	7	347	36 57.3	1 58.02	1 32.0	2 2	1.8	2.96	0.983 9440	1.026 4743	1.026 4903	
	11	347	44 49.5	1 58.05	1 31.8	2 2	13.6	2.95	0.983 8897	1.026 4646	1.026 3973	
	15	347	52 41.7	1 58.08	1 31.7	2 2	25.4	2.95	0.983 8354	1.026 2884	1.026 1380	
	19	348	0 34.1	1 58.11	1 31.5	2 2	37.2	2.94	0.983 7811	1.025 9464	1.025 7136	
	23	348	8 26.6	1 58.14	+ 1 31.3	- 2 2	48.9	- 2.93	0.983 7268	1.025 4400	1.025 1260	
	27	348	16 19.2	1 58.17	1 31.2	2 3	0.6	2.92	0.983 6724	1.024 7719	1.024 3780	
	31	348	24 11.9	1 58.20	1 31.0	2 3	12.2	2.91	0.983 6180	1.023 9444	1.023 4714	
	Apr. 4	348	32 4.8	1 58.23	1 30.9	2 3	23.8	2.90	0.983 5635	1.022 9594	1.022 4085	
		8	348	39 57.7	1 58.26	1 30.7	2 3	35.4	2.89	0.983 5090	1.021 8190	1.021 1909
	12	348	47 50.8	1 58.28	+ 1 30.5	- 2 3	47.0	- 2.88	0.983 4545	1.020 5250	1.019 8216	
	16	348	55 44.1	1 58.31	1 30.4	2 3	58.5	2.87	0.983 4000	1.019 0813	1.018 3046	
	20	349	3 37.4	1 58.34	1 30.2	2 4	9.9	2.86	0.983 3454	1.017 4921	1.016 6444	
	24	349	11 30.7	1 58.37	1 30.0	2 4	21.4	2.85	0.983 2908	1.015 7621	1.014 8460	
	28	349	19 24.3	1 58.40	1 29.9	2 4	32.8	2.84	0.983 2362	1.013 8966	1.012 9146	
May	2	349	27 17.9	1 58.43	+ 1 29.7	- 2 4	44.1	- 2.83	0.983 1816	1.011 9005	1.010 8546	
	6	349	35 11.7	1 58.46	1 29.6	2 4	55.4	2.82	0.983 1269	1.009 7777	1.008 6705	
	10	349	43 5.6	1 58.49	1 29.4	2 5	6.7	2.81	0.983 0722	1.007 5339	1.006 3684	
	14	349	50 59.7	1 58.52	1 29.2	2 5	18.0	2.81	0.983 0174	1.005 1751	1.003 9550	
	18	349	58 53.8	1 58.55	1 29.0	2 5	29.2	2.80	0.982 9626	1.002 7090	1.001 4384	
	22	350	6 48.1	1 58.58	+ 1 28.8	- 2 5	40.3	- 2.79	0.982 9078	1.000 1440	0.998 8269	
	26	350	14 42.5	1 58.61	1 28.7	2 5	51.5	2.78	0.982 8529	0.997 4881	0.996 1285	
	30	350	22 37.0	1 58.64	1 28.5	2 6	2.6	2.77	0.982 7980	0.994 7491	0.993 3510	
	June 3	350	30 31.6	1 58.67	1 28.3	2 6	13.6	2.76	0.982 7431	0.991 9352	0.990 5029	
		7	350	38 26.4	1 58.70	1 28.1	2 6	24.7	2.75	0.982 6882	0.989 0553	0.987 5937
	11	350	46 21.2	1 58.73	+ 1 27.9	- 2 6	35.6	- 2.74	0.982 6333	0.986 1195	0.984 6342	
	15	350	54 16.2	1 58.76	1 27.7	2 6	46.6	2.73	0.982 5783	0.983 1394	0.981 6363	
	19	351	2 11.3	1 58.79	1 27.5	2 6	57.5	2.72	0.982 5233	0.980 1268	0.978 6124	
	23	351	10 6.5	1 58.82	1 27.3	2 7	8.4	2.71	0.982 4682	0.977 0946	0.975 5746	
	27	351	18 1.8	1 58.85	1 27.1	2 7	19.3	2.71	0.982 4131	0.974 0542	0.972 5346	
July	1	351	25 57.3	1 58.88	+ 1 26.9	- 2 7	30.1	- 2.70	0.982 3580	0.971 0175	0.969 5045	
	5	351	33 52.9	1 58.91	+ 1 26.7	- 2 7	40.8	- 2.69	0.982 3029	0.967 9374	0.966 4981	

## SATURN.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
							At Date.	At Interme- diate Date.	
July	1 351 25 57.3	1 58.88	+ 1 26.9	- 2 7 30.1	- 2.70	0.982 3580	0.971 0175	0.969 5045	
	5 351 33 52.9	1 58.91	1 26.7	2 7 40.8	2.69	0.982 3029	0.967 9974	0.966 4981	
	9 351 41 48.6	1 58.94	1 26.5	2 7 51.6	2.68	0.982 2477	0.965 0086	0.963 5306	
	13 351 49 44.4	1 58.97	1 26.3	2 8 2.2	2.67	0.982 1925	0.962 0662	0.960 6173	
	17 351 57 40.3	1 59.00	1 26.1	2 8 12.9	2.66	0.982 1373	0.959 1858	0.957 7738	
	21 352 5 36.4	1 59.03	+ 1 25.8	- 2 8 23.5	- 2.65	0.982 0821	0.956 3827	0.955 0150	
	25 352 13 32.6	1 59.06	1 25.6	2 8 34.1	2.64	0.982 0268	0.953 6720	0.952 3553	
	29 352 21 28.8	1 59.09	1 25.4	2 8 44.6	2.63	0.981 9715	0.951 0670	0.949 8092	
	Aug.	2 352 29 25.2	1 59.12	1 25.2	2 8 55.1	2.62	0.981 9162	0.948 5837	0.947 3923
		6 352 37 21.8	1 59.15	1 25.0	2 9 5.6	2.61	0.981 8609	0.946 2371	0.945 1200
10 352 45 18.4		1 59.18	+ 1 24.7	- 2 9 16.0	- 2.60	0.981 8055	0.944 0430	0.943 0081	
14 352 53 15.2		1 59.21	1 24.5	2 9 26.4	2.59	0.981 7501	0.942 0169	0.941 0710	
18 353 1 12.1		1 59.24	1 24.3	2 9 36.7	2.58	0.981 6946	0.940 1721	0.939 3216	
	22 353 9 9.1	1 59.27	1 24.0	2 9 47.0	2.57	0.981 6391	0.938 5208	0.937 7711	
	26 353 17 6.2	1 59.30	1 23.8	2 9 57.3	2.56	0.981 5836	0.937 0739	0.936 4304	
	30 353 25 3.5	1 59.33	+ 1 23.5	- 2 10 7.5	- 2.55	0.981 5280	0.935 8415	0.935 3089	
	Sept.	3 353 33 0.9	1 59.35	1 23.3	2 10 17.7	2.54	0.981 4724	0.934 8336	0.934 4169
		7 353 40 58.4	1 59.38	1 23.1	2 10 27.8	2.53	0.981 4168	0.934 0596	0.933 7625
11 353 48 56.0		1 59.41	1 22.8	2 10 37.9	2.52	0.981 3612	0.933 5261	0.933 3509	
15 353 56 53.7		1 59.44	1 22.6	2 10 48.0	2.51	0.981 3056	0.933 2372	0.933 1852	
19 354 4 51.6		1 59.47	+ 1 22.3	- 2 10 58.0	- 2.50	0.981 2500	0.933 1948	0.933 2660	
	23 354 12 49.6	1 59.50	1 22.1	2 11 8.0	2.49	0.981 1943	0.933 3985	0.933 5923	
	27 354 20 47.7	1 59.53	1 21.9	2 11 17.9	2.48	0.981 1386	0.933 8472	0.934 1631	
	Oct.	1 354 28 45.9	1 59.57	1 21.6	2 11 27.9	2.47	0.981 0829	0.934 5393	0.934 9751
		5 354 36 44.3	1 59.60	1 21.4	2 11 37.7	2.46	0.981 0272	0.935 4699	0.936 0233
		9 354 44 42.7	1 59.63	+ 1 21.1	- 2 11 47.5	- 2.45	0.980 9715	0.936 6338	0.937 3005
13 354 52 41.3		1 59.66	1 20.8	2 11 57.3	2.44	0.980 9158	0.938 0219	0.938 7966	
17 355 0 40.0		1 59.69	1 20.6	2 12 7.1	2.43	0.980 8601	0.939 6230	0.940 4996	
	21 355 8 38.8	1 59.73	1 20.3	2 12 16.8	2.42	0.980 8044	0.941 4248	0.942 3972	
	25 355 16 37.8	1 59.76	1 20.1	2 12 26.5	2.41	0.980 7486	0.943 4151	0.944 4770	
	29 355 24 36.9	1 59.79	+ 1 19.8	- 2 12 36.1	- 2.40	0.980 6928	0.945 5810	0.946 7253	
	Nov.	2 355 32 36.0	1 59.82	1 19.6	2 12 45.7	2.39	0.980 6370	0.947 9081	0.949 1279
		6 355 40 35.4	1 59.85	1 19.4	2 12 55.2	2.38	0.980 5812	0.950 3823	0.951 6693
10 355 48 34.8		1 59.88	1 19.1	2 13 4.7	2.37	0.980 5253	0.952 9865	0.954 3318	
14 355 56 34.4		1 59.91	1 18.8	2 13 14.2	2.36	0.980 4694	0.955 7029	0.957 0976	
18 356 4 34.1		1 59.94	+ 1 18.5	- 2 13 23.6	- 2.35	0.980 4135	0.958 5140	0.959 9501	
	22 356 12 33.9	1 59.98	1 18.3	2 13 33.0	2.34	0.980 3576	0.961 4041	0.962 8738	
	26 356 20 33.9	2 0.00	1 18.0	2 13 42.3	2.33	0.980 3017	0.964 3572	0.965 8525	
	30 356 28 33.9	2 0.03	1 17.7	2 13 51.6	2.32	0.980 2458	0.967 3576	0.968 8708	
	Dec.	4 356 36 34.1	2 0.06	1 17.4	2 14 0.9	2.31	0.980 1898	0.970 3897	0.971 9122
		8 356 44 34.4	2 0.09	+ 1 17.1	- 2 14 10.1	- 2.30	0.980 1338	0.973 4364	0.974 9602
12 356 52 34.9		2 0.12	1 16.9	2 14 19.3	2.29	0.980 0778	0.976 4818	0.977 9993	
16 357 0 35.4		2 0.16	1 16.6	2 14 28.4	2.28	0.980 0218	0.979 5111	0.981 0153	
20 357 8 36.1		2 0.19	1 16.3	2 14 37.5	2.27	0.979 9658	0.982 5105	0.983 9952	
	24 357 16 36.9	2 0.22	1 16.0	2 14 46.6	2.26	0.979 9098	0.985 4678	0.986 9269	
	28 357 24 37.8	2 0.25	+ 1 15.7	- 2 14 55.6	- 2.25	0.979 8538	0.988 3710	0.989 7985	
	32 357 32 38.8	2 0.28	+ 1 15.4	- 2 15 4.6	- 2.24	0.979 7977	0.991 2081	0.992 5984	

**GREENWICH MEAN NOON.**

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
Jan. 6	278 41 28.8	41.14	+7.2	0 19 40.4	-0.50	1.288 9017	1.310 1994	1.310 0124
14	278 46 57.8	41.13	7.2	0 19 44.4	0.50	1.288 9327	1.309 7301	1.309 3531
22	278 52 26.8	41.13	7.2	0 19 48.4	0.50	1.288 9637	1.308 8829	1.308 3220
30	278 57 55.8	41.12	7.3	0 19 52.4	0.50	1.288 9946	1.307 6727	1.306 9374
Feb. 7	279 3 24.7	41.11	7.3	0 19 56.4	0.50	1.289 0256	1.306 1186	1.305 2193
15	279 8 53.5	41.10	+7.3	0 20 0.4	-0.50	1.289 0566	1.304 2431	1.303 1942
23	279 14 22.3	41.10	7.3	0 20 4.4	0.50	1.289 0875	1.302 0772	1.300 8968
Mar. 3	279 19 51.1	41.10	7.3	0 20 8.4	0.50	1.289 1184	1.299 6580	1.298 3655
11	279 25 19.8	41.09	7.4	0 20 12.4	0.50	1.289 1494	1.297 0243	1.295 6402
19	279 30 48.5	41.08	7.4	0 20 16.4	0.50	1.289 1803	1.294 2195	1.292 7690
27	279 36 17.1	41.07	+7.4	0 20 20.3	-0.50	1.289 2112	1.291 2949	1.289 8040
Apr. 4	279 41 45.7	41.07	7.4	0 20 24.3	0.50	1.289 2421	1.288 3027	1.286 7972
12	279 47 14.2	41.06	7.4	0 20 28.3	0.49	1.289 2730	1.285 2947	1.283 8031
20	279 52 42.7	41.06	7.4	0 20 32.2	0.49	1.289 3039	1.282 3298	1.280 8821
28	279 58 11.1	41.05	7.5	0 20 36.2	0.49	1.289 3347	1.279 4668	1.278 0906
May 6	280 3 39.5	41.05	+7.5	0 20 40.2	-0.49	1.289 3655	1.276 7604	1.275 4829
14	280 9 7.8	41.04	7.5	0 20 44.1	0.49	1.289 3964	1.274 2655	1.273 1150
22	280 14 36.1	41.03	7.5	0 20 48.1	0.49	1.289 4272	1.272 0372	1.271 0381
30	280 20 4.4	41.03	7.5	0 20 52.0	0.49	1.289 4580	1.270 1226	1.269 2953
June 7	280 25 32.6	41.02	7.6	0 20 56.0	0.49	1.289 4888	1.268 5611	1.267 9248
15	280 31 0.7	41.01	+7.6	0 20 59.9	-0.49	1.289 5197	1.267 3905	1.266 9613
23	280 36 28.8	41.01	7.6	0 21 3.8	0.49	1.289 5505	1.266 6389	1.266 4248
July 1	280 41 56.9	41.00	7.6	0 21 7.7	0.49	1.289 5813	1.266 3200	1.266 3261
9	280 47 24.9	41.00	7.6	0 21 11.7	0.49	1.289 6121	1.266 4432	1.266 6709
17	280 52 52.9	40.99	7.7	0 21 15.6	0.49	1.289 6429	1.267 0079	1.267 4521
25	280 58 20.8	40.99	+7.7	0 21 19.5	-0.49	1.289 6737	1.268 0007	1.268 6504
Aug. 2	281 3 48.7	40.98	7.7	0 21 23.4	0.49	1.289 7044	1.269 3980	1.270 2401
10	281 9 16.5	40.98	7.7	0 21 27.3	0.49	1.289 7351	1.271 1724	1.272 1894
18	281 14 44.3	40.97	7.7	0 21 31.2	0.49	1.289 7658	1.273 2853	1.274 4539
26	281 20 12.1	40.97	7.7	0 21 35.1	0.49	1.289 7965	1.275 6892	1.276 9855
Sept. 3	281 25 39.8	40.96	+7.8	0 21 39.0	-0.49	1.289 8272	1.278 3361	1.279 7347
11	281 31 7.4	40.95	7.8	0 21 42.9	0.49	1.289 8579	1.281 1738	1.282 6459
19	281 36 35.0	40.95	7.8	0 21 46.8	0.49	1.289 8886	1.284 1435	1.285 6597
27	281 42 2.6	40.94	7.8	0 21 50.7	0.49	1.289 9193	1.287 1877	1.288 7207
Oct. 5	281 47 30.1	40.94	7.8	0 21 54.6	0.49	1.289 9499	1.290 2518	1.291 7739
13	281 52 57.6	40.93	+7.8	0 21 58.5	-0.48	1.289 9805	1.293 2797	1.294 7619
21	281 58 25.0	40.93	7.9	0 22 2.4	0.48	1.290 0111	1.296 2144	1.297 6319
29	282 3 52.4	40.92	7.9	0 22 6.2	0.48	1.290 0417	1.299 0084	1.300 3379
Nov. 6	282 9 19.8	40.91	7.9	0 22 10.1	0.48	1.290 0723	1.301 6151	1.302 8340
14	282 14 47.1	40.91	7.9	0 22 14.0	0.48	1.290 1029	1.303 9895	1.305 0772
22	282 20 14.3	40.90	+7.9	0 22 17.8	-0.48	1.290 1335	1.306 0932	1.307 0344
30	282 25 41.6	40.90	7.9	0 22 21.7	0.48	1.290 1641	1.307 8964	1.308 6757
Dec. 8	282 31 8.7	40.89	7.9	0 22 25.6	0.48	1.290 1946	1.309 3692	1.309 9741
16	282 36 35.8	40.89	8.0	0 22 29.4	0.48	1.290 2251	1.310 4880	1.310 9099
24	282 42 2.9	40.88	8.0	0 22 33.3	0.48	1.290 2556	1.311 2383	1.311 4717
32	282 47 30.0	40.88	+8.0	0 22 37.1	-0.48	1.290 2861	1.311 6095	1.311 6505
40	282 52 57.0	40.87	+8.0	0 22 40.9	-0.48	1.290 3166	.....	.....



## NEPTUNE.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth--	
							At Date.	At Intermediate Date.
Jan. 6	101 16 22.1	21.91	-42.6	0 52 32.0	+0.59	1.476 1607	1.461 6899	1.461 7985
14	101 19 17.3	21.91	42.5	0 52 27.2	0.59	1.476 1636	1.461 9814	1.462 2374
22	101 22 12.6	21.91	42.5	0 52 22.5	0.59	1.476 1664	1.462 5650	1.462 9622
30	101 25 7.8	21.91	42.5	0 52 17.8	0.59	1.476 1693	1.463 4261	1.463 9542
Feb. 7	101 28 3.1	21.91	42.4	0 52 13.1	0.59	1.476 1721	1.464 5434	1.465 1904
15	101 30 58.3	21.91	-42.4	0 52 8.4	+0.59	1.476 1749	1.465 8915	1.466 6428
23	101 33 53.6	21.91	42.3	0 52 3.6	0.59	1.476 1777	1.467 4394	1.468 2767
Mar. 3	101 36 48.8	21.91	42.3	0 51 58.9	0.59	1.476 1805	1.469 1504	1.470 0563
11	101 39 44.1	21.91	42.2	0 51 54.2	0.59	1.476 1833	1.470 9893	1.471 9448
19	101 42 39.4	21.91	42.2	0 51 49.4	0.59	1.476 1861	1.472 9175	1.473 9021
27	101 45 34.5	21.91	-42.1	0 51 44.7	+0.59	1.476 1889	1.474 8941	1.475 8886
Apr. 4	101 48 29.8	21.91	42.1	0 51 40.0	0.59	1.476 1917	1.476 8813	1.477 8677
12	101 51 25.1	21.91	42.1	0 51 35.2	0.59	1.476 1945	1.478 8433	1.479 8033
20	101 54 20.3	21.91	42.0	0 51 30.5	0.59	1.476 1973	1.480 7436	1.481 6597
28	101 57 15.5	21.91	42.0	0 51 25.7	0.59	1.476 2000	1.482 5486	1.483 4065
May 6	102 0 10.8	21.90	-41.9	0 51 21.0	+0.59	1.476 2028	1.484 2301	1.485 0161
14	102 3 6.0	21.90	41.9	0 51 16.2	0.59	1.476 2055	1.485 7614	1.486 4627
22	102 6 1.2	21.90	41.8	0 51 11.5	0.59	1.476 2083	1.487 1174	1.487 7232
30	102 8 56.5	21.90	41.8	0 51 6.7	0.59	1.476 2110	1.488 2784	1.488 7810
June 7	102 11 51.7	21.90	41.8	0 51 2.0	0.60	1.476 2138	1.489 2291	1.489 6206
15	102 14 46.9	21.90	-41.7	0 50 57.2	+0.60	1.476 2165	1.489 9545	1.490 2292
23	102 17 42.1	21.90	41.7	0 50 52.5	0.60	1.476 2193	1.490 4443	1.490 5992
July 1	102 20 37.4	21.90	41.6	0 50 47.7	0.60	1.476 2220	1.490 6934	1.490 7264
9	102 23 32.6	21.90	41.6	0 50 42.9	0.60	1.476 2247	1.490 6981	1.490 6079
17	102 26 27.8	21.90	41.5	0 50 38.2	0.60	1.476 2274	1.490 4567	1.490 2449
25	102 29 23.0	21.90	-41.5	0 50 33.4	+0.60	1.476 2301	1.489 9736	1.489 6439
Aug. 2	102 32 18.2	21.90	41.4	0 50 28.6	0.60	1.476 2328	1.489 2567	1.488 8128
10	102 35 13.4	21.90	41.4	0 50 23.9	0.60	1.476 2355	1.488 3140	1.487 7617
18	102 38 8.6	21.90	41.3	0 50 19.1	0.60	1.476 2382	1.487 1585	1.486 5069
26	102 41 3.8	21.90	41.3	0 50 14.3	0.60	1.476 2409	1.485 8093	1.485 0679
Sept. 3	102 43 59.0	21.90	-41.2	0 50 9.5	+0.60	1.476 2435	1.484 2853	1.483 4646
11	102 46 54.2	21.90	41.2	0 50 4.7	0.60	1.476 2462	1.482 6093	1.481 7227
19	102 49 49.3	21.90	41.1	0 50 0.0	0.60	1.476 2488	1.480 8089	1.479 8716
27	102 52 44.5	21.90	41.1	0 49 55.2	0.60	1.476 2515	1.478 9148	1.477 9420
Oct. 5	102 55 39.7	21.90	41.0	0 49 50.4	0.60	1.476 2541	1.476 9580	1.475 9671
13	102 58 34.9	21.90	-41.0	0 49 45.6	+0.60	1.476 2568	1.474 9743	1.473 9845
21	103 1 30.0	21.90	40.9	0 49 40.8	0.60	1.476 2594	1.473 0023	1.472 0325
29	103 4 25.2	21.90	40.9	0 49 36.0	0.60	1.476 2620	1.471 0797	1.470 1485
Nov. 6	103 7 20.4	21.90	40.8	0 49 31.2	0.60	1.476 2646	1.469 2441	1.468 3719
14	103 10 15.5	21.90	40.8	0 49 26.4	0.60	1.476 2672	1.467 5367	1.466 7429
22	103 13 10.7	21.90	-40.8	0 49 21.6	+0.60	1.476 2698	1.465 9945	1.465 2958
30	103 16 5.9	21.89	40.7	0 49 16.8	0.60	1.476 2724	1.464 6506	1.464 0631
Dec. 8	103 19 1.0	21.89	40.7	0 49 12.0	0.60	1.476 2749	1.463 5370	1.463 0754
16	103 21 56.2	21.89	40.6	0 49 7.2	0.60	1.476 2775	1.462 6810	1.462 3561
24	103 24 51.3	21.89	40.6	0 49 2.4	0.60	1.476 2800	1.462 1027	1.461 9222
32	103 27 46.5	21.89	-40.5	0 48 57.6	+0.60	1.476 2826	1.461 8156	1.461 7842
40	103 30 41.6	21.89	-40.5	0 48 52.8	+0.60	1.476 2851	1.461 8280	...

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Jan. 1	+0.169 7965	+0.178 4016	+661	-0.888 4715	-0.887 0496	+212	-0.385 3924	-0.384 7753	-196
2	0.186 9930	0.195 5702	651	0.885 5589	0.883 9997	221	0.384 1284	0.383 4518	190
3	0.204 1324	0.212 6790	641	0.882 3718	0.880 6755	229	0.382 7454	0.382 0093	184
4	0.221 2093	0.229 7228	630	0.878 9109	0.877 0780	237	0.381 2436	0.380 4483	179
5	0.238 2189	0.246 6967	620	0.875 1768	0.873 2077	245	0.379 6234	0.378 7690	173
6	+0.255 1558	+0.263 5954	+610	-0.871 1706	-0.869 0656	+252	-0.377 8852	-0.376 9721	-168
7	0.272 0150	0.280 4138	599	0.866 8930	0.864 6529	259	0.376 0297	0.375 0580	163
8	0.288 7912	0.297 1465	588	0.862 3453	0.859 9703	266	0.374 0570	0.373 0268	158
9	0.305 4790	0.313 7881	577	0.857 5282	0.855 0191	272	0.371 9676	0.370 8794	153
10	0.322 0731	0.330 3333	566	0.852 4432	0.849 8005	278	0.369 7622	0.368 6160	148
11	+0.338 5679	+0.346 7763	+555	-0.847 0913	-0.844 3159	+284	-0.367 4411	-0.366 2375	-143
12	0.354 9579	0.363 1119	544	0.841 4744	0.838 5670	289	0.365 0053	0.363 7445	138
13	0.371 2376	0.379 3344	533	0.835 5940	0.832 5556	294	0.362 4553	0.361 1377	133
14	0.387 4015	0.395 4384	522	0.829 4520	0.826 2836	299	0.359 7918	0.358 4178	128
15	0.403 4442	0.411 4183	511	0.823 0506	0.819 7534	304	0.357 0158	0.355 5859	123
16	+0.419 3601	+0.427 2690	+500	-0.816 3922	-0.812 9672	+308	-0.354 1283	-0.352 6430	-118
17	0.435 1444	0.442 9855	489	0.809 4788	0.805 9275	312	0.351 1303	0.349 5901	113
18	0.450 7918	0.458 5626	478	0.802 3135	0.798 6371	316	0.348 0227	0.346 4283	108
19	0.466 2973	0.473 9954	467	0.794 8987	0.791 0988	319	0.344 8070	0.343 1589	103
20	0.481 6563	0.489 2794	456	0.787 2375	0.783 3151	322	0.341 4841	0.339 7828	99
21	+0.496 8642	+0.504 4101	+445	-0.779 3320	-0.775 2887	+325	-0.338 0551	-0.336 3013	-94
22	0.511 9166	0.519 3831	434	0.771 1855	0.767 0227	327	0.334 5215	0.332 7157	89
23	0.526 8090	0.534 1940	423	0.762 8006	0.758 5197	329	0.330 8842	0.329 0272	84
24	0.541 5373	0.548 8384	413	0.754 1803	0.749 7827	331	0.327 1447	0.325 2370	80
25	0.556 0969	0.563 3122	402	0.745 3272	0.740 8143	333	0.323 3042	0.321 3464	75
26	+0.570 4838	+0.577 6113	+391	-0.736 2444	-0.731 6177	+334	-0.319 3638	-0.317 3566	-71
27	0.584 6940	0.591 7314	380	0.726 9347	0.722 1958	335	0.315 3250	0.313 2691	66
28	0.598 7231	0.605 6686	370	0.717 4012	0.712 5513	336	0.311 1890	0.309 0849	62
29	0.612 5675	0.619 4191	359	0.707 6466	0.702 6874	336	0.306 9571	0.304 8057	58
30	0.626 2230	0.632 9788	348	0.697 6741	0.692 6070	337	0.302 6308	0.300 4325	54
31	+0.639 6859	+0.646 3440	+338	-0.687 4865	-0.682 3130	+337	-0.298 2111	-0.295 9667	-50
Feb. 1	0.652 9525	0.659 5108	328	0.677 0868	0.671 8084	337	0.293 6994	0.291 4096	46
2	0.666 0186	0.672 4753	318	0.666 4782	0.661 0964	337	0.289 0973	0.286 7627	42
3	0.678 8804	0.685 2335	308	0.655 6635	0.650 1798	336	0.284 4059	0.282 0272	38
4	0.691 5340	0.697 7816	298	0.644 6457	0.639 0617	336	0.279 6268	0.277 2046	34
5	+0.703 9757	+0.710 1157	+289	-0.633 4282	-0.627 7455	+335	-0.274 7610	-0.272 2960	-31
6	0.716 2013	0.722 2319	280	0.622 0141	0.616 2344	334	0.269 8100	0.267 3032	27
7	0.728 2071	0.734 1263	271	0.610 4069	0.604 5319	333	0.264 7756	0.262 2275	24
8	0.739 9891	0.745 7949	262	0.598 6098	0.592 6412	332	0.259 6590	0.257 0703	20
9	0.751 5433	0.757 2337	253	0.586 6265	0.580 5664	330	0.254 4616	0.251 8333	17
10	+0.762 8658	+0.768 4390	+244	-0.574 4612	-0.568 3114	+329	-0.249 1855	-0.246 5182	-13
11	0.773 9528	0.779 4069	235	0.562 1175	0.555 8799	327	0.243 8317	0.241 1264	10
12	0.784 8007	0.790 1338	226	0.549 5992	0.543 2761	325	0.238 4024	0.235 6600	7
13	0.795 4058	0.800 6164	218	0.536 9111	0.530 5046	323	0.232 8993	0.230 1207	-4
14	0.805 7652	0.810 8515	209	0.524 0572	0.517 5696	321	0.227 3243	0.224 5104	0
15	+0.815 8751	+0.820 8358	+201	-0.511 0422	-0.504 4756	+319	-0.221 6793	-0.218 8310	+3
16	+0.825 7332	+0.830 5669	+193	-0.497 8704	-0.491 2271	+317	-0.215 9659	-0.213 0844	+6

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Feb. 16	+0.825 7332	+0.830 5669	+ 193	-0.497 8704	-0.491 2271	+ 317	-0.215 9659	-0.213 0844	+ 6
17	0.835 3365	0.840 0416	185	0.484 5463	0.477 8285	314	0.210 1866	0.207 2726	9
18	0.844 6819	0.849 2573	177	0.471 0743	0.464 2842	311	0.204 3427	0.201 3974	12
19	0.853 7675	0.858 2122	169	0.457 4589	0.450 5989	308	0.198 4367	0.195 4608	15
20	0.862 5910	0.866 9036	161	0.443 7047	0.436 7769	305	0.192 4701	0.189 4648	18
21	+0.871 1497	+0.875 3292	+ 154	-0.429 8160	-0.422 8226	+ 302	-0.186 4452	-0.183 4114	+ 21
22	0.879 4418	0.883 4872	146	0.415 7973	0.408 7405	299	0.180 3638	0.177 3025	24
23	0.887 4651	0.891 3753	139	0.401 6529	0.394 5350	296	0.174 2277	0.171 1398	27
24	0.895 2175	0.898 9916	132	0.387 3874	0.380 2104	293	0.168 0390	0.164 9254	30
25	0.902 6974	0.906 3344	125	0.373 0047	0.365 7709	289	0.161 7994	0.158 6612	33
26	+0.909 9026	+0.913 4019	+ 118	-0.358 5095	-0.351 2211	+ 286	-0.155 5110	-0.152 3491	+ 36
27	0.916 8320	0.920 1925	112	0.343 9061	0.336 5651	282	0.149 1758	0.145 9912	38
28	0.923 4834	0.926 7044	105	0.329 1986	0.321 8072	279	0.142 7955	0.139 5890	41
Mar 1	0.929 8554	0.932 9362	99	0.314 3915	0.306 9519	275	0.136 3720	0.133 1448	43
2	0.935 9464	0.938 8859	93	0.299 4889	0.292 0031	271	0.129 9074	0.126 6601	45
3	+0.941 7544	+0.944 5519	+ 87	-0.284 4950	-0.276 9651	+ 267	-0.123 4031	-0.120 1368	+ 47
4	0.947 2781	0.949 9328	81	0.269 4139	0.261 8422	263	0.116 8613	0.113 5769	49
5	0.952 5159	0.955 0271	75	0.254 2503	0.246 6388	259	0.110 2838	0.106 9823	51
6	0.957 4662	0.959 8330	69	0.239 0083	0.231 3593	255	0.103 6725	0.100 3548	53
7	0.962 1272	0.964 3488	64	0.223 6925	0.216 0083	251	0.097 0293	0.093 6964	55
8	+0.966 4974	+0.968 5729	+ 58	-0.208 3074	-0.200 5903	+ 247	-0.090 3562	-0.087 0090	+ 57
9	0.970 5751	0.972 5040	53	0.192 8576	0.185 1099	242	0.083 6550	0.080 2946	59
10	0.974 3593	0.976 1408	48	0.177 3478	0.169 5721	238	0.076 9279	0.073 5553	61
11	0.977 8483	0.979 4817	43	0.161 7834	0.153 9821	233	0.070 1771	0.066 7934	63
12	0.981 0410	0.982 5261	38	0.146 1689	0.138 3444	228	0.063 4046	0.060 0108	65
13	+0.983 9368	+0.985 2729	+ 33	-0.130 5094	-0.122 6644	+ 223	-0.056 6124	-0.053 2097	+ 66
14	0.986 5345	0.987 7214	28	0.114 8102	0.106 9474	219	0.049 8029	0.046 3923	68
15	0.988 8337	0.989 8712	24	0.099 0765	0.091 1982	214	0.042 9782	0.039 5609	70
16	0.990 8339	0.991 7219	20	0.083 3132	0.075 4222	209	0.036 1407	0.032 7178	72
17	0.992 5351	0.993 2736	16	0.067 5257	0.059 6243	204	0.029 2924	0.025 8649	73
18	+0.993 9373	+0.994 5260	+ 12	-0.051 7186	-0.043 8094	+ 199	-0.022 4355	-0.019 0046	+ 75
19	0.995 0398	0.995 4790	8	0.035 8973	0.027 9827	194	0.015 5723	0.012 1390	76
20	0.995 8436	0.996 1334	4	0.020 0663	-0.012 1488	189	0.008 7048	-0.005 2702	78
21	0.996 3487	0.996 4895	+ 1	-0.004 2306	+0.003 6876	184	-0.001 8352	+0.001 5999	79
22	0.996 5557	0.996 5474	- 3	+0.011 6052	0.019 5213	179	+0.005 0347	0.008 4688	81
23	+0.996 4647	+0.996 3078	- 6	+0.027 4355	+0.035 3475	+ 174	+0.011 9022	+0.015 3346	+ 82
24	0.996 0767	0.995 7715	9	0.043 2566	0.051 1622	169	0.018 7658	0.022 1954	83
25	0.995 3922	0.994 9389	12	0.059 0637	0.066 9605	164	0.025 6232	0.029 0489	84
26	0.994 4118	0.993 8110	15	0.074 8521	0.082 7379	159	0.032 4724	0.035 8934	86
27	0.993 1366	0.992 3885	17	0.090 6173	0.098 4899	154	0.039 3117	0.042 7269	87
28	+0.991 5669	+0.990 6721	- 20	+0.106 3550	+0.114 2122	+ 149	+0.046 1388	+0.049 5472	+ 88
29	0.989 7042	0.988 6632	22	0.122 0609	0.129 9005	144	0.052 9520	0.056 3528	89
30	0.987 5492	0.986 3621	24	0.137 7306	0.145 5506	139	0.059 7495	0.063 1417	90
31	0.985 1022	0.983 7699	26	0.153 3599	0.161 1581	133	0.066 5293	0.069 9120	91
Apr. 1	0.982 3650	0.980 8875	28	0.168 9446	0.176 7191	127	0.073 2896	0.076 6618	92
2	+0.979 3376	+0.977 7155	- 30	+0.184 4808	+0.192 2291	+ 121	+0.080 0285	+0.083 3893	+ 93
3	+0.976 0212	+0.974 2548	- 32	+0.199 9636	+0.207 6837	+ 115	+0.086 7442	+0.090 0928	+ 94

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Apr. 1	+0.982 3650	+0.980 8875	- 28	+0.168 9446	+0.176 7191	+ 127	+0.073 2896	+0.076 6618	+ 92
2	0.979 3376	0.977 7155	30	0.184 4808	0.192 2291	121	0.080 0285	0.083 3893	93
3	0.976 0212	0.974 2548	32	0.199 9636	0.207 6837	115	0.086 7442	0.090 0928	94
4	0.972 4164	0.970 5061	33	0.215 3889	0.223 0785	109	0.093 4348	0.096 7701	95
5	0.968 5241	0.966 4705	34	0.230 7521	0.238 4091	103	0.100 0984	0.103 4195	96
6	+0.964 3455	+0.962 1492	- 35	+0.246 0489	+0.253 6708	+ 97	+0.106 7331	+0.110 0390	+ 97
7	0.959 8816	0.957 5429	36	0.261 2744	0.268 8590	91	0.113 3369	0.116 6266	98
8	0.955 1334	0.952 6532	37	0.276 4240	0.283 9689	86	0.119 9078	0.123 1804	99
9	0.950 1025	0.947 4816	38	0.291 4931	0.298 9960	80	0.126 4440	0.129 6983	100
10	0.944 7906	0.942 0297	38	0.306 4771	0.313 9356	74	0.132 9432	0.136 1783	101
11	+0.939 1992	+0.936 2992	- 38	+0.321 3711	+0.328 7828	+ 68	+0.139 4035	+0.142 6185	+ 102
12	0.933 3301	0.930 2922	38	0.336 1703	0.343 5331	62	0.145 8230	0.149 0167	103
13	0.927 1857	0.924 0107	38	0.350 8706	0.358 1822	56	0.152 1994	0.155 3710	104
14	0.920 7676	0.917 4569	38	0.365 4672	0.372 7251	50	0.158 5312	0.161 6797	104
15	0.914 0788	0.910 6335	38	0.379 9555	0.387 1579	44	0.164 8162	0.167 9405	105
16	+0.907 1214	+0.903 5428	- 37	+0.394 3316	+0.401 4760	+ 38	+0.171 0524	+0.174 1518	+ 106
17	0.899 8980	0.896 1874	36	0.408 5907	0.415 6752	33	0.177 2383	0.180 3117	107
18	0.892 4114	0.888 5702	35	0.422 7291	0.429 7518	27	0.183 3718	0.186 4183	108
19	0.884 6641	0.880 6936	34	0.436 7428	0.443 7015	21	0.189 4511	0.192 4700	109
20	0.876 6589	0.872 5606	32	0.450 6275	0.457 5204	15	0.195 4748	0.198 4650	110
21	+0.868 3988	+0.864 1740	- 31	+0.464 3796	+0.471 2048	+ 9	+0.201 4406	+0.204 4016	+ 110
22	0.859 8864	0.855 5365	29	0.477 9955	0.484 7511	+ 3	0.207 3476	0.210 2783	111
23	0.851 1247	0.846 6514	27	0.491 4713	0.498 1555	- 3	0.213 1936	0.216 0933	112
24	0.842 1170	0.837 5218	24	0.504 8034	0.511 4144	9	0.218 9772	0.221 8451	113
25	0.832 8661	0.828 1503	22	0.517 9882	0.524 5244	15	0.224 6968	0.227 5323	114
26	+0.823 3748	+0.818 5401	- 19	+0.531 0227	+0.537 4826	- 20	+0.230 3512	+0.233 1533	+ 115
27	0.813 6464	0.808 6942	16	0.543 9036	0.550 2852	26	0.235 9385	0.238 7067	115
28	0.803 6836	0.798 6150	13	0.556 6273	0.562 9293	32	0.241 4577	0.244 1912	116
29	0.793 4889	0.788 3058	10	0.569 1909	0.575 4117	38	0.246 9072	0.249 6055	117
30	0.783 0658	0.777 7693	6	0.581 5912	0.587 7291	43	0.252 2858	0.254 9479	118
May 1	+0.772 4166	+0.767 0082	- 3	+0.593 8249	+0.599 8782	- 49	+0.257 5917	+0.260 2171	+ 118
2	0.761 5443	0.756 0253	+ 1	0.605 8885	0.611 8556	54	0.262 8240	0.265 4121	119
3	0.750 4516	0.744 8236	5	0.617 7787	0.623 6576	59	0.267 9811	0.270 5308	120
4	0.739 1416	0.733 4061	9	0.629 4919	0.635 2813	64	0.273 0612	0.275 5721	121
5	0.727 6174	0.721 7759	13	0.641 0251	0.646 7228	69	0.278 0633	0.280 5346	122
6	+0.715 8821	+0.709 9363	+ 18	+0.652 3742	+0.657 9788	- 74	+0.282 9858	+0.285 4166	+ 123
7	0.703 9390	0.697 8906	23	0.663 5362	0.669 0459	79	0.287 8270	0.290 2167	124
8	0.691 7917	0.685 6426	28	0.674 5075	0.679 9205	83	0.292 5855	0.294 9334	125
9	0.679 4438	0.673 1958	33	0.685 2846	0.690 5994	88	0.297 2602	0.299 5655	126
10	0.666 8990	0.660 5540	39	0.695 8644	0.701 0792	92	0.301 8493	0.304 1114	127
11	+0.654 1612	+0.647 7213	+ 45	+0.706 2435	+0.711 3570	- 97	+0.306 3516	+0.308 5698	+ 128
12	0.641 2346	0.634 7017	51	0.716 4193	0.721 4297	101	0.310 7657	0.312 9392	129
13	0.628 1231	0.621 4992	57	0.726 3880	0.731 2940	105	0.315 0902	0.317 2185	130
14	0.614 8307	0.608 1181	63	0.736 1473	0.740 9477	109	0.319 3240	0.321 4065	131
15	0.601 3620	0.594 5627	70	0.745 6946	0.750 3877	113	0.323 4659	0.325 5019	132
16	+0.587 7209	+0.580 8372	+ 77	+0.755 0267	+0.759 6116	- 117	+0.327 5145	+0.329 5036	+ 133
17	+0.573 9120	+0.566 9459	+ 84	+0.764 1418	+0.768 6169	- 121	+0.331 4691	+0.333 4106	+ 134

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
May 17	+0.573 9120	+0.566 9459	+ 84	+0.764 1418	+0.768 6169	- 121	+0.331 4691	+0.333 4106	+ 134
18	0.559 9395	0.552 8932	91	0.773 0368	0.777 4012	124	0.335 3281	0.337 2216	135
19	0.545 8077	0.538 6836	98	0.781 7099	0.785 9626	127	0.339 0909	0.340 9359	136
20	0.531 5213	0.524 3213	105	0.790 1590	0.794 2987	130	0.342 7565	0.344 5524	138
21	0.517 0842	0.509 8108	112	0.798 3816	0.802 4074	133	0.346 3237	0.348 0702	139
22	+0.502 5014	+0.495 1566	+ 119	+0.806 3760	+0.810 2871	- 135	+0.349 7918	+0.351 4884	+ 140
23	0.487 7769	0.480 3628	126	0.814 1405	0.817 9358	138	0.353 1600	0.354 8063	141
24	0.472 9149	0.465 4338	134	0.821 6730	0.825 3519	140	0.356 4274	0.358 0232	143
25	0.457 9199	0.450 3738	142	0.828 9723	0.832 5339	142	0.359 5935	0.361 1383	144
26	0.442 7960	0.435 1870	150	0.836 0365	0.839 4800	143	0.362 6575	0.364 1510	146
27	+0.427 5473	+0.419 8775	+ 158	+0.842 8641	+0.846 1887	- 145	+0.365 6188	+0.367 0606	+ 147
28	0.412 1780	0.404 4492	167	0.849 4536	0.852 6586	146	0.368 4764	0.369 8663	149
29	0.396 6917	0.388 9060	175	0.855 8035	0.858 8879	147	0.371 2301	0.372 5678	150
30	0.381 0926	0.373 2520	184	0.861 9118	0.864 8749	148	0.373 8792	0.375 1641	152
31	0.365 3847	0.357 4912	192	0.867 7771	0.870 6181	148	0.376 4225	0.377 6544	153
June 1	+0.349 5720	+0.341 6278	+ 201	+0.873 3976	+0.876 1154	- 148	+0.378 8597	+0.380 9382	+ 155
2	0.333 6590	0.325 6662	209	0.878 7713	0.881 3650	148	0.381 1899	0.382 3147	156
3	0.317 6499	0.309 6106	218	0.883 8963	0.886 3652	148	0.383 4126	0.384 4834	158
4	0.301 5490	0.293 4656	227	0.888 7714	0.891 1146	147	0.385 5269	0.386 5431	160
5	0.285 3610	0.277 2358	236	0.893 3946	0.895 6114	146	0.387 5320	0.388 4935	162
6	+0.269 0906	+0.260 9261	+ 245	+0.897 7646	+0.899 8540	- 145	+0.389 4274	+0.390 3337	+ 163
7	0.252 7428	0.244 5412	254	0.901 8796	0.903 8412	143	0.391 2124	0.392 0634	165
8	0.236 3220	0.228 0859	263	0.905 7387	0.907 5717	141	0.392 8865	0.393 6818	167
9	0.219 8335	0.211 5653	272	0.909 3402	0.911 0442	139	0.394 4491	0.395 1885	169
10	0.203 2820	0.194 9843	281	0.912 6835	0.914 2580	137	0.395 8999	0.396 5831	170
11	+0.186 6727	+0.178 3478	+ 290	+0.915 7676	+0.917 2121	- 134	+0.397 2382	+0.397 8651	+ 172
12	0.170 0104	0.161 6612	299	0.918 5914	0.919 9056	131	0.398 4638	0.399 0341	174
13	0.153 3005	0.144 9289	308	0.921 1544	0.922 3377	128	0.399 5761	0.400 0898	176
14	0.136 5474	0.128 1565	317	0.923 4558	0.924 5085	124	0.400 5751	0.401 0321	177
15	0.119 7568	0.111 3488	326	0.925 4957	0.926 4173	120	0.401 4606	0.401 8606	179
16	+0.102 9332	+0.094 5107	+ 335	+0.927 2732	+0.928 0635	- 116	+0.402 2322	+0.402 5753	+ 181
17	0.086 0818	0.077 6472	343	0.928 7881	0.929 4472	112	0.402 8899	0.403 1760	183
18	0.069 2076	0.060 7634	352	0.930 0407	0.930 5685	107	0.403 4336	0.403 6627	185
19	0.052 3154	0.043 8640	361	0.931 0306	0.931 4270	102	0.403 8633	0.404 0354	187
20	0.035 4100	0.026 9540	370	0.931 7579	0.932 0233	97	0.404 1789	0.404 2940	189
21	+0.018 4964	+0.010 0378	+ 378	+0.932 2232	+0.932 3576	- 92	+0.404 3806	+0.404 4388	+ 192
22	+0.001 5790	-0.006 8795	387	0.932 4265	0.932 4301	86	0.404 4686	0.404 4700	194
23	-0.015 3373	0.023 7939	395	0.932 3683	0.932 2410	80	0.404 4430	0.404 3875	197
24	0.032 2486	0.040 7008	404	0.932 0484	0.931 7906	74	0.404 3037	0.404 1916	199
25	0.049 1501	0.057 5959	412	0.931 4677	0.931 0796	67	0.404 0512	0.403 8825	202
26	-0.066 0377	-0.074 4750	+ 420	+0.930 6263	+0.930 1080	- 60	+0.403 6855	+0.403 4603	+ 204
27	0.082 9071	0.091 3336	427	0.929 5246	0.928 8761	52	0.403 2069	0.402 9253	206
28	0.099 7539	0.108 1675	435	0.928 1626	0.927 3840	45	0.402 6154	0.402 2773	208
29	0.116 5739	0.124 9724	442	0.926 5403	0.925 6316	37	0.401 9110	0.401 5166	211
30	0.133 3626	0.141 7438	449	0.924 6580	0.923 6193	29	0.401 0940	0.400 6432	213
July 1	-0.150 1154	-0.158 4769	+ 456	+0.922 5157	+0.921 3472	- 20	+0.400 1643	+0.399 6572	+ 216
2	-0.166 8277	-0.175 1670	+ 463	+0.920 1138	+0.918 8155	- 11	+0.399 1220	+0.398 5588	+ 218

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
July 1	-0.150 1154	-0.158 4769	+ 456	+0.922 5157	+0.921 3472	- 20	+0.400 1643	+0.399 6572	+ 216
2	0.166 8277	0.175 1670	463	0.920 1138	0.918 8155	11	0.399 1220	0.398 5588	218
3	0.183 4944	0.191 8094	470	0.917 4525	0.916 0248	- 2	0.397 9675	0.397 3482	221
4	0.200 1112	0.208 3992	477	0.914 5324	0.912 9754	+ 7	0.396 7009	0.396 0256	223
5	0.216 6729	0.224 9316	483	0.911 3539	0.909 6680	17	0.395 3223	0.394 5912	226
6	-0.233 1746	-0.241 4015	+ 489	+0.907 9177	+0.906 1033	+ 26	+0.393 8322	+0.393 0454	+ 229
7	0.249 6115	0.257 8041	495	0.904 2248	0.902 2823	36	0.392 2308	0.391 3884	232
8	0.265 9786	0.274 1344	501	0.900 2759	0.898 2058	46	0.390 5184	0.389 6208	234
9	0.282 2710	0.290 3876	506	0.896 0722	0.893 8751	56	0.388 6956	0.387 7430	237
10	0.298 4839	0.306 5590	512	0.891 6147	0.889 2913	66	0.386 7629	0.385 7555	240
11	-0.314 6123	-0.322 6433	+ 517	+0.886 9050	+0.884 4559	+ 77	+0.384 7207	+0.383 6587	+ 243
12	0.330 6513	0.338 6358	522	0.881 9443	0.879 3703	88	0.382 5695	0.381 4533	245
13	0.346 5963	0.354 5320	526	0.876 7341	0.874 0360	100	0.380 3101	0.379 1400	248
14	0.362 4425	0.370 3271	530	0.871 2762	0.868 4548	111	0.377 9432	0.376 7197	250
15	0.378 1852	0.386 0163	534	0.865 5721	0.862 6284	123	0.375 4695	0.374 1927	253
16	-0.393 8199	-0.401 5953	+ 538	+0.859 6240	+0.856 5589	+ 135	+0.372 8895	+0.371 5601	+ 255
17	0.409 3420	0.417 0594	541	0.853 4335	0.850 2480	147	0.370 2045	0.368 8228	258
18	0.424 7470	0.432 4043	544	0.847 0029	0.843 6982	159	0.367 4152	0.365 9816	261
19	0.440 0308	0.447 6259	547	0.840 3342	0.836 9111	171	0.364 5223	0.363 0373	264
20	0.455 1891	0.462 7200	549	0.833 4293	0.829 8892	183	0.361 5268	0.359 9910	266
21	-0.470 2180	-0.477 6826	+ 551	+0.826 2909	+0.822 6347	+ 196	+0.358 4300	+0.356 8437	+ 269
22	0.485 1133	0.492 5098	553	0.818 9209	0.815 1497	209	0.355 2324	0.353 5962	272
23	0.499 8716	0.507 1981	554	0.811 3214	0.807 4363	222	0.351 9353	0.350 2497	275
24	0.514 4889	0.521 7436	555	0.803 4947	0.799 4967	235	0.348 5395	0.346 8049	278
25	0.528 9616	0.536 1426	556	0.795 4427	0.791 3328	248	0.345 0460	0.343 2629	281
26	-0.543 2860	-0.550 3914	+ 556	+0.787 1674	+0.782 9467	+ 261	+0.341 4558	+0.339 6247	+ 284
27	0.557 4582	0.564 4861	556	0.778 6710	0.774 3403	274	0.337 7697	0.335 8909	287
28	0.571 4746	0.578 4231	555	0.769 9550	0.765 5153	287	0.333 9884	0.332 0623	290
29	0.585 3311	0.592 1983	554	0.761 0215	0.756 4740	300	0.330 1128	0.328 1401	293
30	0.599 0240	0.605 8077	553	0.751 8729	0.747 2184	313	0.326 1442	0.324 1252	296
31	-0.612 5490	-0.619 2474	+ 552	+0.742 5108	+0.737 7506	+ 327	+0.322 0832	+0.320 0184	+ 298
Aug. 1	0.625 9022	0.632 5129	550	0.732 9380	0.728 0732	340	0.317 9309	0.315 8208	301
2	0.639 0790	0.645 6002	548	0.723 1566	0.718 1885	354	0.313 6882	0.311 5333	303
3	0.652 0758	0.658 5054	546	0.713 1693	0.708 0991	367	0.309 3563	0.307 1573	306
4	0.664 8884	0.671 2245	544	0.702 9784	0.697 8078	381	0.304 9363	0.302 6937	308
5	-0.677 5130	-0.683 7534	+ 541	+0.692 5874	+0.687 3174	+ 394	+0.300 4295	+0.298 1438	+ 311
6	0.689 9453	0.696 0882	537	0.681 9983	0.676 6306	408	0.295 8369	0.293 5089	314
7	0.702 1816	0.708 2251	533	0.671 2145	0.665 7505	421	0.291 1599	0.288 7901	317
8	0.714 2181	0.720 1602	529	0.660 2390	0.654 6804	435	0.286 3997	0.283 9888	319
9	0.726 0510	0.731 8898	524	0.649 0751	0.643 4233	448	0.281 5576	0.279 1063	322
10	-0.737 6764	-0.743 4102	+ 519	+0.637 7257	+0.631 9828	+ 462	+0.276 6352	+0.274 1443	+ 324
11	0.749 0909	0.754 7179	514	0.626 1948	0.620 3621	475	0.271 6338	0.269 1040	327
12	0.760 2909	0.765 8094	509	0.614 4852	0.608 5647	488	0.266 5550	0.263 9868	329
13	0.771 2731	0.776 6814	503	0.602 6009	0.596 5943	501	0.261 3998	0.258 7943	332
14	0.782 0341	0.787 3308	497	0.590 5453	0.584 4545	514	0.256 1705	0.253 5284	334
15	-0.792 5711	-0.797 7545	+ 491	+0.578 3222	+0.572 1490	+ 527	+0.250 8683	+0.248 1904	+ 337
16	-0.802 8808	-0.807 9495	+ 484	+0.565 9352	+0.559 6814	+ 539	+0.245 4949	+0.242 7820	+ 339

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Aug. 16	-0.802 8808	-0.807 9495	+484	+0.565 9352	+0.559 6814	+ 539	+0.245 4949	+0.242 7820	+ 339
17	0.812 9604	0.817 9131	477	0.553 3881	0.547 0558	552	0.240 0518	0.237 3046	342
18	0.822 8072	0.827 6425	469	0.540 6848	0.534 2755	564	0.234 5407	0.231 7602	344
19	0.832 4187	0.837 1355	461	0.527 8285	0.521 3444	577	0.228 9633	0.226 1504	347
20	0.841 7925	0.846 3896	453	0.514 8234	0.508 2659	589	0.223 3215	0.220 4765	349
21	-0.850 9263	-0.855 4024	+444	+0.501 6724	+0.495 0436	+ 601	+0.217 6158	+0.214 7400	+ 351
22	0.859 8177	0.864 1717	435	0.488 3797	0.481 6813	613	0.211 8490	0.208 9430	353
23	0.868 4643	0.872 6952	426	0.474 9487	0.468 1821	625	0.206 0221	0.203 0866	355
24	0.876 8639	0.880 9701	417	0.461 3821	0.454 5493	637	0.200 1367	0.197 1725	357
25	0.885 0137	0.888 9944	407	0.447 6840	0.440 7865	649	0.194 1943	0.191 2022	359
26	-0.892 9118	-0.896 7655	+397	+0.433 8574	+0.426 8972	+ 660	+0.188 1963	+0.185 1769	+ 361
27	0.900 5555	0.904 2809	387	0.419 9062	0.412 8848	672	0.182 1443	0.179 0986	363
28	0.907 9418	0.911 5380	376	0.405 8336	0.398 7530	683	0.176 0400	0.172 9686	365
29	0.915 0690	0.918 5344	365	0.391 6435	0.384 5056	694	0.169 8847	0.166 7885	367
30	0.921 9340	0.925 2675	354	0.377 3397	0.370 1464	704	0.163 8803	0.160 5602	369
31	-0.928 5345	-0.931 7347	+342	+0.362 9261	+0.355 6793	+ 715	+0.157 4284	+0.154 2852	+ 371
Sept. 1	0.934 8680	0.937 9341	330	0.348 4066	0.341 1084	725	0.151 1307	0.147 9652	372
2	0.940 9326	0.943 8630	318	0.333 7854	0.326 4380	735	0.144 7889	0.141 6020	374
3	0.946 7253	0.949 5193	305	0.319 0667	0.311 6721	744	0.138 4048	0.135 1974	376
4	0.952 2446	0.954 9011	293	0.304 2547	0.296 8150	754	0.131 9802	0.128 7533	378
5	-0.957 4884	-0.960 0062	+280	+0.289 3536	+0.281 8712	+ 763	+0.125 5170	+0.122 2716	+ 379
6	0.962 4543	0.964 8327	267	0.274 3683	0.266 8452	772	0.119 0172	0.115 7541	380
7	0.967 1411	0.969 3791	253	0.259 3027	0.251 7414	781	0.112 4825	0.109 2027	381
8	0.971 5465	0.973 6432	240	0.244 1617	0.236 5644	790	0.105 9149	0.102 6194	382
9	0.975 6690	0.977 6237	226	0.228 9499	0.221 3190	799	0.099 3165	0.096 0064	383
10	-0.979 5072	-0.981 3193	+212	+0.213 6721	+0.206 0098	+ 807	+0.092 6893	+0.089 3655	+ 384
11	0.983 0599	0.984 7290	198	0.198 3327	0.190 6415	815	0.086 0352	0.082 6988	385
12	0.986 3262	0.987 8513	184	0.182 9367	0.175 2189	823	0.079 3564	0.076 0084	386
13	0.989 3043	0.990 6853	169	0.167 4887	0.159 7467	831	0.072 6549	0.069 2962	387
14	0.991 9942	0.993 2308	154	0.151 9934	0.144 2294	838	0.065 9326	0.062 5644	388
15	-0.994 3950	-0.995 4868	+139	+0.136 4554	+0.128 6718	+ 845	+0.059 1919	+0.055 8152	+ 388
16	0.996 5062	0.997 4531	124	0.120 8793	0.113 0784	852	0.052 4345	0.049 0502	389
17	0.998 3274	0.999 1292	109	0.105 2697	0.097 4536	858	0.045 6625	0.042 2717	389
18	0.999 8583	1.000 5148	93	0.089 6308	0.081 8019	864	0.038 8779	0.035 4815	389
19	1.001 0985	1.001 6095	77	0.073 9672	0.066 1272	870	0.032 0826	0.028 6814	390
20	-1.002 0476	-1.002 4128	+ 61	+0.058 2826	+0.050 4340	+ 875	+0.025 2781	+0.021 8732	+ 390
21	1.002 7052	1.002 9249	45	0.042 5819	0.034 7266	880	0.018 4668	0.015 0591	390
22	1.003 0716	1.003 1452	29	0.026 8687	0.019 0088	885	0.011 6504	0.008 2408	390
23	1.003 1458	1.003 0733	+ 12	+0.011 1475	+0.003 2852	890	+0.004 8306	+0.001 4201	390
24	1.002 9276	1.002 7087	- 4	-0.004 5775	-0.012 4402	895	-0.001 9906	-0.005 4013	390
25	-1.002 4165	-1.002 0510	- 21	-0.020 3023	-0.028 1631	+ 900	-0.008 8116	-0.012 2214	+ 389
26	1.001 6122	1.001 1000	38	0.036 0220	0.043 8786	904	0.015 6303	0.019 0382	389
27	1.000 5147	0.999 8556	55	0.051 7324	0.059 5827	908	0.022 4448	0.025 8499	388
28	0.999 1231	0.998 3173	72	0.067 4290	0.075 2708	912	0.029 2533	0.032 6547	388
29	0.997 4381	0.996 4852	90	0.083 1074	0.090 9380	915	0.036 0538	0.039 4503	387
30	-0.995 4587	-0.994 3589	-107	-0.098 7622	-0.106 5796	+ 918	-0.042 8441	-0.046 2349	+ 386
Oct. 1	-0.993 1856	-0.991 9389	-125	-0.114 3895	-0.122 1912	+ 921	-0.049 6224	-0.053 0063	+ 385

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Oct. 1	-0.993 1856	-0.991 9389	-125	-0.114 3895	-0.122 1912	+ 921	-0.049 6224	-0.053 0063	+ 385
2	0.990 6187	0.989 2252	143	0.129 9842	0.137 7677	923	0.056 3864	0.059 7626	384
3	0.987 7583	0.986 2182	161	0.145 5413	0.153 3044	925	0.063 1345	0.066 5018	382
4	0.984 6048	0.982 9182	179	0.161 0564	0.168 7966	927	0.069 8642	0.073 2216	381
5	0.981 1586	0.979 3260	197	0.176 5245	0.184 2393	928	0.076 5737	0.079 9201	379
6	-0.977 4205	-0.975 4420	-215	-0.191 9405	-0.199 6274	+ 929	-0.083 2606	-0.086 5950	+ 378
7	0.973 3909	0.971 2673	233	0.207 2994	0.214 9561	930	0.089 9230	0.093 2444	376
8	0.969 0713	0.966 8028	251	0.222 5967	0.230 2205	931	0.096 5589	0.099 8661	374
9	0.964 4622	0.962 0497	269	0.237 8269	0.245 4154	931	0.103 1658	0.106 4577	372
10	0.959 5655	0.957 0098	287	0.252 9854	0.260 5363	931	0.109 7416	0.113 0173	370
11	-0.954 3827	-0.951 6843	-306	-0.268 0674	-0.275 5782	+ 931	-0.116 2845	-0.119 5426	+ 368
12	0.948 9149	0.946 0750	324	0.283 0680	0.290 5364	930	0.122 7921	0.126 0321	366
13	0.943 1646	0.940 1839	343	0.297 9827	0.305 4065	930	0.129 2626	0.132 4832	363
14	0.937 1331	0.934 0125	362	0.312 8070	0.320 1839	929	0.135 6939	0.138 8943	361
15	0.930 8225	0.927 5633	381	0.327 5365	0.334 8644	928	0.142 0841	0.145 2631	358
16	-0.924 2351	-0.920 8381	-400	-0.342 1669	-0.349 4435	+ 927	-0.148 4312	-0.151 5880	+ 355
17	0.917 3726	0.913 8389	419	0.356 6938	0.363 9173	925	0.154 7334	0.157 8671	352
18	0.910 2373	0.906 5680	438	0.371 1135	0.378 2818	923	0.160 9889	0.164 0986	349
19	0.902 8312	0.899 0270	457	0.385 4218	0.392 5328	921	0.167 1959	0.170 2806	346
20	0.895 1559	0.891 2182	476	0.399 6145	0.406 6663	919	0.173 3526	0.176 4116	343
21	-0.887 2141	-0.883 1436	-495	-0.413 6878	-0.420 6785	+ 916	-0.179 4574	-0.182 4898	+ 339
22	0.879 0072	0.874 8051	514	0.427 6378	0.434 5652	913	0.185 5085	0.188 5133	336
23	0.870 5375	0.866 2048	534	0.441 4603	0.448 3225	909	0.191 5041	0.194 4806	332
24	0.861 8072	0.857 3449	553	0.455 1514	0.461 9463	905	0.197 4427	0.200 3900	328
25	0.852 8181	0.848 2270	572	0.468 7068	0.475 4324	901	0.203 3223	0.206 2395	324
26	-0.843 5721	-0.838 8537	-591	-0.482 1225	-0.488 7766	+ 897	-0.209 1412	-0.212 0274	+ 320
27	0.834 0720	0.829 2274	611	0.495 3942	0.501 9748	892	0.214 8977	0.217 7518	316
28	0.824 3201	0.819 3503	630	0.508 5179	0.515 0229	887	0.220 5897	0.223 4112	312
29	0.814 3184	0.809 2248	649	0.521 4892	0.527 9164	881	0.226 2160	0.229 0038	307
30	0.804 0699	0.798 8539	669	0.534 3040	0.540 6514	875	0.231 7743	0.234 5274	302
31	-0.793 5771	-0.788 2400	-688	-0.546 9581	-0.553 2236	+ 869	-0.237 2629	-0.239 9805	+ 297
Nov. 1	0.782 8428	0.777 3860	707	0.559 4473	0.565 6289	863	0.242 6801	0.245 3614	292
2	0.771 8700	0.766 2950	727	0.571 7677	0.577 8630	856	0.248 0242	0.250 6681	287
3	0.760 6615	0.754 9700	746	0.583 9145	0.589 9218	849	0.253 2931	0.255 8989	282
4	0.749 2208	0.743 4143	765	0.595 8842	0.601 8012	842	0.258 4854	0.261 0522	276
5	-0.737 5511	-0.731 6316	-785	-0.607 6722	-0.613 4969	+ 834	-0.263 5991	-0.266 1259	+ 271
6	0.725 6561	0.719 6251	804	0.619 2747	0.625 0051	826	0.268 6323	0.271 1182	265
7	0.713 5392	0.707 3989	823	0.630 6877	0.636 3220	818	0.273 5834	0.276 0277	260
8	0.701 2046	0.694 9568	842	0.641 9074	0.647 4434	809	0.278 4509	0.280 8527	254
9	0.688 6560	0.682 3027	861	0.652 9298	0.658 3661	800	0.283 2329	0.285 5914	248
10	-0.675 8977	-0.669 4412	-880	-0.663 7519	-0.669 0867	+ 791	-0.287 9280	-0.290 2425	+ 242
11	0.662 9340	0.656 3763	899	0.674 3701	0.679 6016	781	0.292 5347	0.294 8043	236
12	0.649 7687	0.643 1120	918	0.684 7809	0.689 9077	771	0.297 0513	0.299 2755	230
13	0.636 4065	0.629 6527	937	0.694 9816	0.700 0024	761	0.301 4768	0.303 6550	224
14	0.622 8511	0.616 0026	956	0.704 9695	0.709 8825	750	0.305 8098	0.307 9411	217
15	-0.609 1072	-0.602 1656	-975	-0.714 7412	-0.719 5452	+ 739	-0.310 0488	-0.312 1328	+ 210
16	-0.595 1784	-0.588 1460	-993	-0.724 2941	-0.728 9877	+ 728	-0.314 1929	-0.316 2290	+ 203



## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Nov. 16	-0.595 1784	-0.588 1460	-993	-0.724 2941	-0.728 9877	+728	-0.314 1929	-0.316 2290	+203
17	0.581 0690	0.573 9479	1012	0.733 6257	0.738 2076	716	0.318 2408	0.320 2282	196
18	0.566 7831	0.559 5753	1030	0.742 7332	0.747 2021	704	0.322 1912	0.324 1295	188
19	0.552 3248	0.545 0322	1048	0.751 6139	0.755 9684	692	0.326 0431	0.327 9318	181
20	0.537 6980	0.530 3227	1066	0.760 2652	0.764 5041	679	0.329 7955	0.331 6340	173
21	-0.522 9069	-0.515 4510	-1084	-0.768 6846	-0.772 8064	+666	-0.333 4471	-0.335 2347	+166
22	0.507 9555	0.500 4211	1102	0.776 8691	0.780 8725	652	0.336 9967	0.338 7330	158
23	0.492 8482	0.485 2372	1120	0.784 8163	0.788 7001	638	0.340 4434	0.342 1277	150
24	0.477 5888	0.469 9036	1138	0.792 5235	0.796 2862	624	0.343 7859	0.345 4178	142
25	0.462 1822	0.454 4249	1156	0.799 9880	0.803 6285	609	0.347 0233	0.348 6022	134
26	-0.446 6324	-0.438 8052	-1173	-0.807 2074	-0.810 7244	+594	-0.350 1544	-0.351 6797	+126
27	0.430 9440	0.423 0492	1190	0.814 1792	0.817 5714	579	0.353 1781	0.354 6493	118
28	0.415 1215	0.407 1616	1207	0.820 9007	0.824 1669	563	0.356 0933	0.357 5100	109
29	0.399 1696	0.391 1465	1224	0.827 3697	0.830 5087	546	0.358 8991	0.360 2606	101
30	0.383 0929	0.375 0094	1240	0.833 5836	0.836 5942	529	0.361 5943	0.362 9002	92
Dec. 1	-0.366 8965	-0.358 7548	-1257	-0.839 5401	-0.842 4212	+512	-0.364 1781	-0.365 4279	+84
2	0.350 5851	0.342 3881	1273	0.845 2370	0.847 9873	495	0.366 6494	0.367 8425	75
3	0.334 1642	0.325 9140	1289	0.850 6718	0.853 2902	477	0.369 0071	0.370 1432	66
4	0.317 6383	0.309 3380	1304	0.855 8424	0.858 3281	459	0.371 2505	0.372 3290	57
5	0.301 0136	0.292 6657	1319	0.860 7471	0.863 0990	441	0.373 3786	0.374 3991	48
6	-0.284 2950	-0.275 9024	-1334	-0.865 3837	-0.867 6011	+422	-0.375 3905	-0.376 3527	+39
7	0.267 4886	0.259 0539	1349	0.869 7510	0.871 8330	402	0.377 2857	0.378 1892	30
8	0.250 5997	0.242 1261	1363	0.873 8472	0.875 7934	382	0.379 0633	0.379 9079	20
9	0.233 6340	0.225 1241	1377	0.877 6715	0.879 4813	362	0.380 7229	0.381 5083	11
10	0.216 5971	0.208 0537	1391	0.881 2226	0.882 8953	342	0.382 2639	0.382 9897	+1
11	-0.199 4946	-0.190 9203	-1404	-0.884 4994	-0.886 0349	+321	-0.383 6858	-0.384 3524	-8
12	0.182 3316	0.173 7293	1417	0.887 5017	0.888 8996	299	0.384 9891	0.385 5954	18
13	0.165 1139	0.156 4861	1430	0.890 2285	0.891 4886	277	0.386 1716	0.386 7182	28
14	0.147 8466	0.139 1960	1442	0.892 6795	0.893 8011	255	0.387 2348	0.387 7212	38
15	0.130 5349	0.121 8641	1454	0.894 8535	0.895 8370	232	0.388 1775	0.388 6041	48
16	-0.113 1842	-0.104 4956	-1465	-0.896 7513	-0.897 5960	+209	-0.389 0006	-0.389 3668	-58
17	0.095 7992	0.087 0956	1477	0.898 3712	0.899 0770	186	0.389 7028	0.390 0088	68
18	0.078 3854	0.069 6692	1488	0.899 7133	0.900 2801	163	0.390 2846	0.390 5301	78
19	0.060 9476	0.052 2213	1498	0.900 7773	0.901 2048	139	0.390 7454	0.390 9305	88
20	0.043 4910	0.034 7573	1507	0.901 5626	0.901 8507	115	0.391 0854	0.391 2100	98
21	-0.026 0208	-0.017 2822	-1516	-0.902 0691	-0.902 2175	+91	-0.391 3044	-0.391 3685	-108
22	-0.008 5420	+0.000 1990	1525	0.902 2961	0.902 3049	66	0.391 4023	0.391 4059	119
23	+0.008 9402	0.017 6810	1534	0.902 2439	0.902 1129	41	0.391 3791	0.391 3220	129
24	0.026 4206	0.035 1585	1543	0.901 9120	0.901 6410	+15	0.391 2345	0.391 1167	140
25	0.043 8939	0.052 6263	1551	0.901 3001	0.900 8893	-11	0.390 9686	0.390 7902	151
26	+0.061 3549	+0.070 0791	-1559	-0.900 4086	-0.899 8578	-37	-0.390 5815	-0.390 3425	-162
27	0.078 7983	0.087 5117	1566	0.899 2371	0.898 5463	63	0.390 0732	0.389 7735	173
28	0.096 2187	0.104 9186	1572	0.897 7856	0.896 9550	89	0.389 4435	0.389 0832	184
29	0.113 6108	0.122 2945	1577	0.896 0544	0.895 0839	116	0.388 6927	0.388 2719	195
30	0.130 9691	0.139 6338	1582	0.894 0435	0.892 9332	143	0.387 8208	0.387 3394	205
31	+0.148 2879	+0.156 9308	-1586	-0.891 7532	-0.890 5035	-171	-0.386 8277	-0.386 2859	-215
32	+0.165 5617	+0.174 1799	-1590	-0.889 1842	-0.887 7952	-199	-0.385 7139	-0.385 1116	-225

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		Day of Month.	FEBRUARY.		Day of Month.	MARCH.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	118 45 14.3	- 0 20 31.5	1.0	165 17 11.8	+ 3 35 44.5	1.0	174 42 59.3	+ 4 7 9.8
1.5	124 47 26.5	+ 0 12 46.6	1.5	171 44 55.5	4 0 30.1	1.5	181 23 12.1	4 27 15.0
2.0	130 51 38.1	0 46 8.2	2.0	178 16 4.7	4 22 21.6	2.0	188 6 54.9	4 43 48.3
2.5	136 58 6.6	1 19 12.0	2.5	184 50 44.0	4 40 57.5	2.5	194 53 51.6	4 56 30.2
3.0	143 7 10.9	1 51 35.9	3.0	191 28 57.5	4 55 58.3	3.0	201 43 45.0	5 5 4.5
3.5	149 19 10.8	+ 2 22 57.0	3.5	198 10 49.4	+ 5 7 6.2	3.5	208 36 17.0	+ 5 9 18.9
4.0	155 34 27.7	2 52 52.7	4.0	204 56 22.7	5 14 5.9	4.0	215 31 9.7	5 9 5.0
4.5	161 53 23.4	3 21 0.3	4.5	211 45 39.8	5 16 44.8	4.5	222 28 5.7	5 4 19.1
5.0	168 16 21.5	3 46 56.6	5.0	218 38 41.4	5 14 53.8	5.0	229 26 48.7	4 55 1.7
5.5	174 43 44.2	4 10 18.6	5.5	225 35 25.9	5 8 27.1	5.5	236 27 3.6	4 41 18.3
6.0	181 15 53.4	+ 4 30 43.6	6.0	232 35 49.5	+ 4 57 23.0	6.0	243 28 37.3	+ 4 23 18.7
6.5	187 53 9.8	4 47 49.6	6.5	239 39 45.3	4 41 44.4	6.5	250 31 17.7	4 1 17.5
7.0	194 35 51.2	5 1 14.9	7.0	246 47 2.0	4 21 39.2	7.0	257 34 54.0	3 35 33.1
7.5	201 24 12.1	5 10 39.5	7.5	253 57 24.4	3 57 20.3	7.5	264 39 15.7	3 6 28.3
8.0	208 18 21.6	5 15 44.9	8.0	261 10 32.0	3 29 6.7	8.0	271 44 13.1	2 34 29.3
8.5	215 18 23.3	+ 5 16 15.4	8.5	268 25 59.3	+ 2 57 22.8	8.5	278 49 35.1	+ 2 0 6.2
9.0	222 24 12.9	5 11 58.9	9.0	275 43 15.6	2 22 38.3	9.0	285 55 9.8	1 23 51.3
9.5	229 35 38.1	5 2 47.4	9.5	283 1 45.1	1 45 28.6	9.5	293 0 43.5	0 46 20.1
10.0	236 52 17.0	4 48 38.8	10.0	290 20 47.5	1 6 32.7	10.0	300 6 0.0	+ 0 8 8.8
10.5	244 13 38.3	4 29 37.5	10.5	297 39 38.8	+ 0 26 32.8	10.5	307 10 40.5	- 0 30 4.9
11.0	251 39 1.0	+ 4 5 55.0	11.0	304 57 32.6	- 0 13 46.9	11.0	314 14 23.4	- 1 7 43.4
11.5	259 7 35.0	3 37 51.1	11.5	312 13 41.5	0 53 41.9	11.5	321 16 44.6	1 44 9.7
12.0	266 38 22.3	3 5 52.8	12.0	319 27 18.3	1 32 29.5	12.0	328 17 18.0	2 18 49.2
12.5	274 10 18.5	2 30 34.6	12.5	326 37 38.1	2 9 29.7	12.5	335 15 35.6	2 51 9.7
13.0	281 42 16.9	1 52 38.0	13.0	333 43 59.7	2 44 6.6	13.0	342 11 9.4	3 20 42.9
13.5	289 13 8.4	+ 1 12 48.3	13.5	340 45 46.6	- 3 15 49.2	13.5	349 3 31.7	- 3 47 4.4
14.0	296 41 45.8	+ 0 31 53.6	14.0	347 42 28.7	3 44 12.7	14.0	355 52 16.5	4 9 55.0
14.5	304 7 6.5	- 0 9 16.6	14.5	354 33 43.0	4 8 57.8	14.5	2 37 0.5	4 28 59.7
15.0	311 28 13.3	0 49 54.8	15.0	1 19 13.9	4 29 51.3	15.0	9 17 24.4	4 44 9.2
15.5	318 44 17.5	1 29 16.4	15.5	7 58 53.3	4 40 45.0	15.5	15 53 13.5	4 55 18.7
16.0	325 54 39.8	- 2 6 42.3	16.0	14 32 41.2	- 4 59 36.0	16.0	22 24 18.4	- 5 2 27.8
16.5	332 58 50.9	2 41 38.7	16.5	21 0 44.5	5 8 24.8	16.5	28 50 35.5	5 5 39.4
17.0	339 56 31.2	3 13 37.7	17.0	27 23 16.5	5 13 15.7	17.0	35 12 7.2	5 5 0.1
17.5	346 47 31.4	3 42 18.0	17.5	33 40 36.6	5 14 15.1	17.5	41 29 1.6	5 0 38.6
18.0	353 31 51.1	4 7 24.0	18.0	39 53 9.3	5 11 31.6	18.0	47 41 32.7	4 52 45.9
18.5	0 9 38.3	- 4 28 44.9	18.5	46 1 23.0	- 5 5 15.0	18.5	53 49 59.9	- 4 41 34.2
19.0	6 41 7.7	4 46 15.2	19.0	52 5 49.6	4 55 36.1	19.0	59 54 47.2	4 27 16.7
19.5	13 6 40.0	4 59 52.5	19.5	58 7 3.6	4 42 45.9	19.5	65 56 22.6	4 10 7.0
20.0	19 26 40.7	5 9 37.8	20.0	64 5 41.0	4 26 56.3	20.0	71 55 18.1	3 50 19.2
20.5	25 41 38.8	5 15 34.3	20.5	70 2 19.5	4 8 19.3	20.5	77 52 8.6	3 28 7.6
21.0	31 52 6.1	- 5 17 46.4	21.0	75 57 36.9	- 3 47 7.1	21.0	83 47 31.1	- 3 3 46.1
21.5	37 58 35.9	5 16 20.8	21.5	81 52 11.0	3 23 32.3	21.5	89 42 4.6	2 37 29.5
22.0	44 1 42.5	5 11 24.5	22.0	87 46 39.3	2 57 47.8	22.0	95 36 29.4	2 9 32.1
22.5	50 2 0.6	5 3 5.6	22.5	93 41 37.8	2 30 7.5	22.5	101 31 26.0	1 40 8.8
23.0	56 0 4.3	4 51 32.8	23.0	99 37 41.3	2 0 45.8	23.0	107 27 35.0	1 9 35.1
23.5	61 56 27.1	- 4 36 55.3	23.5	105 35 22.7	- 1 29 58.0	23.5	113 25 36.7	- 0 38 7.0
24.0	67 51 41.2	4 19 23.2	24.0	111 35 12.5	0 58 0.7	24.0	119 26 9.5	- 0 6 1.4
24.5	73 46 17.4	3 59 7.1	24.5	117 37 38.4	- 0 25 12.5	24.5	125 29 50.2	+ 0 26 23.2
25.0	79 40 44.7	3 36 18.6	25.0	123 43 4.7	+ 0 8 7.0	25.0	131 37 12.9	0 58 47.3
25.5	85 35 30.1	3 11 10.0	25.5	129 51 52.7	0 41 37.4	25.5	137 48 48.1	1 30 49.9
26.0	91 30 58.4	- 2 43 55.0	26.0	136 4 19.5	+ 1 14 55.9	26.0	144 5 2.1	+ 2 2 8.0
26.5	97 27 32.7	2 14 48.6	26.5	142 20 38.4	1 47 38.5	26.5	150 26 16.3	2 32 17.7
27.0	103 25 33.4	1 44 6.7	27.0	148 40 58.4	2 19 19.8	27.0	156 52 46.0	3 0 53.4
27.5	109 25 19.1	1 12 7.0	27.5	155 5 24.2	2 49 33.9	27.5	163 24 40.3	3 27 28.7
28.0	115 27 6.1	0 39 8.3	28.0	161 33 56.1	3 17 54.5	28.0	170 2 1.0	3 51 36.7
28.5	121 31 8.7	- 0 5 31.2	28.5	168 6 30.2	+ 3 43 55.0	28.5	176 44 42.3	+ 4 12 50.5
29.0	127 37 39.5	+ 0 28 23.1	29.0	174 42 59.3	4 7 9.8	29.0	183 32 31.1	4 30 44.8
29.5	133 46 49.4	1 2 11.7	29.5	181 23 12.1	4 27 15.0	29.5	190 25 7.0	4 44 55.8
30.0	139 58 47.6	1 35 30.8	30.0	188 6 54.9	4 43 48.3	30.0	197 22 3.0	4 55 2.9
30.5	146 13 42.4	2 7 56.4	30.5	194 53 51.6	4 56 30.2	30.5	204 22 46.3	5 0 49.1
31.0	152 31 40.6	+ 2 39 3.6	31.0	201 43 45.0	+ 5 5 4.5	31.0	211 26 39.7	+ 5 2 2.6
31.5	158 52 48.5	+ 3 8 27.8	31.5	208 36 17.0	+ 5 9 18.9	31.5	218 33 3.2	+ 4 58 36.9

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		Day of Month.	MAY.		Day of Month.	JUNE.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	225 41 16.0	+ 4 50 30.2	1.0	264 31 30.5	+ 2 40 20.7	1.0	317 40 44.6	- 2 3 37.3
1.5	232 50 37.6	4 37 50.8	1.5	271 49 50.4	2 6 21.2	1.5	324 42 2.7	2 37 32.0
2.0	240 0 29.7	4 30 47.1	2.0	279 5 21.3	1 30 29.2	2.0	331 37 53.0	3 8 40.7
2.5	247 10 17.7	3 59 36.5	2.5	286 17 35.4	0 53 24.1	2.5	338 28 20.3	3 36 42.2
3.0	254 19 31.7	3 34 41.0	3.0	293 26 13.3	+ 0 15 44.9	3.0	345 13 34.1	4 1 19.8
3.5	261 27 46.6	+ 3 6 26.2	3.5	300 31 2.8	- 0 21 50.2	3.5	351 53 47.1	- 4 22 21.2
4.0	268 34 42.6	2 35 21.2	4.0	307 31 57.9	0 58 45.4	4.0	358 29 14.6	4 39 37.9
4.5	275 40 5.2	2 1 57.4	4.5	314 28 58.4	1 34 27.7	4.5	5 0 13.3	4 53 4.4
5.0	282 43 44.2	1 26 49.2	5.0	321 22 7.6	2 8 26.9	5.0	11 27 0.8	5 2 38.5
5.5	289 45 33.0	0 50 30.0	5.5	328 11 31.6	2 40 16.2	5.5	17 49 54.3	5 8 20.5
6.0	296 45 27.7	+ 0 13 35.0	6.0	334 57 18.0	- 3 9 32.2	6.0	24 9 10.6	- 5 10 13.0
6.5	303 43 26.1	- 0 23 21.4	6.5	341 39 34.9	3 35 54.5	6.5	30 25 6.0	5 8 20.8
7.0	310 39 27.0	0 59 45.2	7.0	348 18 30.6	3 59 6.2	7.0	36 37 56.0	5 2 50.6
7.5	317 33 28.4	1 35 4.3	7.5	354 54 12.7	4 18 53.6	7.5	42 47 55.1	4 53 50.9
8.0	324 25 27.8	2 8 48.0	8.0	1 26 47.3	4 35 6.2	8.0	48 55 16.8	4 41 31.8
8.5	331 15 21.0	- 2 40 27.8	8.5	7 56 19.4	- 4 47 36.5	8.5	55 0 13.8	- 4 26 4.8
9.0	338 3 2.0	3 9 37.8	9.0	14 22 52.7	4 56 20.2	9.0	61 2 58.5	4 7 43.0
9.5	344 48 22.5	3 35 55.2	9.5	20 46 29.5	5 1 15.8	9.5	67 3 43.2	3 46 40.7
10.0	351 31 12.9	3 59 0.7	10.0	27 7 11.6	5 2 24.9	10.0	73 2 40.2	3 23 13.1
10.5	358 11 21.7	4 18 38.3	10.5	33 25 0.7	4 59 51.4	10.5	79 0 2.2	2 57 36.6
11.0	4 48 36.7	- 4 34 36.0	11.0	39 39 57.9	- 4 53 41.9	11.0	84 56 2.9	- 2 30 8.3
11.5	11 22 45.9	4 46 45.7	11.5	45 52 5.2	4 44 5.4	11.5	90 50 56.9	2 1 5.6
12.0	17 53 37.8	4 55 3.0	12.0	52 1 26.0	4 31 13.0	12.0	96 45 0.4	1 30 46.7
12.5	24 21 2.0	4 59 27.5	12.5	58 8 5.4	4 15 17.4	12.5	102 38 30.9	0 59 30.1
13.0	30 44 50.7	5 0 1.9	13.0	64 12 10.4	3 56 32.5	13.0	108 31 47.7	- 0 27 34.5
13.5	37 4 59.4	- 4 56 52.3	13.5	70 13 50.6	- 3 35 13.5	13.5	114 25 12.4	+ 0 4 41.5
14.0	43 21 27.1	4 50 7.3	14.0	76 13 18.5	3 11 36.9	14.0	120 19 8.2	0 36 59.0
14.5	49 34 16.4	4 39 57.8	14.5	82 10 49.2	2 45 59.3	14.5	126 14 0.8	1 8 59.3
15.0	55 43 34.3	4 26 36.3	15.0	88 6 41.2	2 18 37.9	15.0	132 10 17.5	1 40 23.6
15.5	61 49 32.8	4 10 16.8	15.5	94 1 16.3	1 49 49.9	15.5	138 8 27.9	2 10 53.2
16.0	67 52 28.1	- 3 51 14.3	16.0	99 54 59.4	- 1 19 52.8	16.0	144 9 3.0	+ 2 40 9.0
16.5	73 52 40.4	3 29 44.1	16.5	105 48 17.9	0 49 4.1	16.5	150 12 35.5	3 7 52.2
17.0	79 50 34.3	3 6 2.0	17.0	111 41 42.5	- 0 17 41.0	17.0	156 19 38.8	3 33 43.3
17.5	85 46 38.0	2 40 24.1	17.5	117 35 46.4	+ 0 13 58.8	17.5	162 30 46.6	3 57 22.6
18.0	91 41 23.1	2 13 6.0	18.0	123 31 5.1	0 45 37.8	18.0	168 46 32.9	4 18 30.3
18.5	97 35 24.4	- 1 44 24.2	18.5	129 28 15.9	+ 1 16 58.1	18.5	175 7 30.3	+ 4 36 46.4
19.0	103 29 19.0	1 44 34.1	19.0	135 27 57.7	1 47 41.5	19.0	181 34 9.1	4 51 50.6
19.5	109 23 45.8	0 43 52.1	19.5	141 30 49.0	2 17 29.2	19.5	188 6 56.9	5 3 23.0
20.0	115 19 25.6	- 0 12 34.8	20.0	147 37 32.0	2 46 1.8	20.0	194 46 16.9	5 11 4.3
20.5	121 16 59.7	+ 0 19 1.1	20.5	153 48 43.5	3 12 58.7	20.5	201 32 26.3	5 14 35.9
21.0	127 17 10.1	+ 0 50 37.9	21.0	160 5 1.9	+ 3 37 58.6	21.0	208 25 34.8	+ 5 13 41.8
21.5	133 20 37.8	1 21 57.2	21.5	166 27 1.9	4 0 39.7	21.5	215 25 44.5	5 8 9.2
22.0	139 28 2.8	1 52 39.4	22.0	172 55 14.5	4 20 39.1	22.0	222 32 46.9	4 57 49.0
22.5	145 40 3.1	2 22 23.7	22.5	179 30 5.5	4 37 33.2	22.5	229 46 23.0	4 42 37.3
23.0	151 57 13.3	2 50 47.9	23.0	186 11 53.9	4 50 58.4	23.0	237 6 2.5	4 22 37.0
23.5	158 20 3.3	+ 3 17 28.4	23.5	193 0 50.3	+ 5 0 32.2	23.5	244 31 4.3	+ 3 57 58.6
24.0	164 48 58.1	3 42 0.6	24.0	199 56 56.1	5 5 53.4	24.0	252 0 36.3	3 29 0.4
24.5	171 24 15.7	4 3 59.0	24.5	207 0 1.8	5 6 43.6	24.5	259 33 37.1	2 56 9.2
25.0	178 6 6.0	4 22 57.7	25.0	214 9 46.5	5 2 48.8	25.0	267 8 58.5	2 20 0.1
25.5	184 54 29.3	4 38 31.2	25.5	221 25 37.2	4 53 59.7	25.5	274 45 28.3	1 41 14.5
26.0	191 49 18.4	+ 4 50 15.2	26.0	228 46 50.2	+ 4 40 13.8	26.0	282 21 53.0	+ 1 0 39.7
26.5	198 50 12.5	4 57 48.0	26.5	236 12 31.2	4 21 36.4	26.5	289 56 59.0	+ 0 19 5.6
27.0	205 56 42.7	5 0 51.5	27.0	243 41 36.7	3 58 21.1	27.0	297 29 37.5	- 0 22 36.7
27.5	213 8 9.9	4 59 12.4	27.5	251 12 58.4	3 30 49.4	27.5	304 58 46.1	1 3 37.2
28.0	220 23 46.3	4 52 43.5	28.0	258 45 25.4	2 59 30.9	28.0	312 23 30.6	1 43 9.7
28.5	227 42 38.0	+ 4 41 24.1	28.5	266 17 46.1	+ 2 25 2.2	28.5	319 43 6.7	- 2 20 32.6
29.0	235 3 46.6	4 25 21.3	29.0	273 48 52.2	1 48 4.8	29.0	326 56 59.8	2 55 10.9
29.5	242 26 11.7	4 4 49.2	29.5	281 17 40.7	1 9 24.1	29.5	334 4 46.1	3 26 35.4
30.0	249 48 53.9	3 40 9.2	30.0	288 43 16.7	+ 0 29 46.2	30.0	341 6 11.0	3 54 23.9
30.5	257 10 57.0	3 11 48.7	30.5	296 4 54.5	- 0 10 2.9	30.5	348 1 9.6	4 18 20.4
31.0	264 31 30.5	+ 2 40 20.7	31.0	303 21 57.8	- 0 49 19.3	31.0	354 49 44.4	- 4 38 14.8
31.5	271 49 50.4	+ 2 6 21.2	31.5	310 34 0.2	- 1 27 22.7	31.5	1 32 4.7	- 4 54 1.0

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		Day of Month.	AUGUST.		Day of Month.	SEPTEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
	° ' "	° ' "		° ' "	° ' "		° ' "	° ' "
1.0	354 49 44.4	-4 38 14.8	1.0	42 40 50.9	-4 59 9.7	1.0	87 21 17.7	-2 12 21.1
1.5	1 32 4.7	4 54 1.0	1.5	48 52 1.6	4 46 8.5	1.5	93 15 37.4	1 42 41.7
2.0	8 8 25.6	5 5 37.6	2.0	54 59 4.0	4 29 59.9	2.0	99 9 15.3	1 12 0.9
2.5	14 39 6.1	5 13 7.0	2.5	61 2 31.9	4 10 59.0	2.5	105 2 47.7	0 40 35.7
3.0	21 4 28.4	5 16 34.1	3.0	67 2 59.1	3 49 21.5	3.0	110 56 48.9	-0 8 43.4
3.5	27 24 57.0	-5 16 5.9	3.5	73 0 59.1	-3 25 23.0	3.5	116 51 50.8	+0 23 18.0
4.0	33 40 57.7	5 11 51.1	4.0	78 57 4.8	2 59 19.0	4.0	122 48 23.0	0 55 10.0
4.5	39 52 56.8	5 3 59.7	4.5	84 51 47.2	2 31 26.2	4.5	128 46 52.3	1 26 33.7
5.0	46 1 20.7	4 52 42.9	5.0	90 45 36.3	2 2 1.0	5.0	134 47 41.9	1 57 9.4
5.5	52 6 35.4	4 38 12.8	5.5	96 39 0.2	1 31 20.5	5.5	140 51 11.9	2 26 36.5
6.0	58 9 6.1	-4 20 42.6	6.0	102 32 25.1	-0 59 42.6	6.0	146 57 38.9	+2 54 34.5
6.5	64 9 16.8	4 0 26.4	6.5	108 26 15.1	-0 27 24.8	6.5	153 7 15.9	3 20 42.5
7.0	70 7 30.5	3 37 38.8	7.0	114 20 52.6	+0 5 13.8	7.0	159 20 12.3	3 44 39.4
7.5	76 4 9.0	3 12 35.1	7.5	120 16 37.8	0 37 53.7	7.5	165 36 34.2	4 6 5.0
8.0	81 59 33.0	2 45 31.4	8.0	126 13 49.0	1 10 15.2	8.0	171 56 24.5	4 24 39.4
8.5	87 54 2.1	-2 16 44.5	8.5	132 12 42.9	+1 41 58.1	8.5	178 19 43.1	+4 40 4.8
9.0	93 47 54.9	1 46 32.0	9.0	138 13 34.6	2 12 41.8	9.0	184 46 27.7	4 52 3.9
9.5	99 41 29.2	1 15 12.2	9.5	144 16 37.5	2 42 5.4	9.5	191 16 33.7	5 0 22.6
10.0	105 35 2.5	0 43 3.5	10.0	150 22 4.0	3 9 48.3	10.0	197 49 55.1	5 4 48.8
10.5	111 28 52.1	-0 10 25.0	10.5	156 30 5.7	3 35 30.4	10.5	204 26 25.7	5 5 13.4
11.0	117 23 15.0	+0 22 23.6	11.0	162 40 53.2	+3 58 51.9	11.0	211 5 58.6	+5 1 30.8
11.5	123 18 28.6	0 55 2.7	11.5	168 54 36.6	4 19 33.5	11.5	217 48 27.1	4 53 38.5
12.0	129 14 50.5	1 27 12.4	12.0	175 11 26.0	4 37 17.4	12.0	224 33 45.4	4 41 37.9
12.5	135 12 39.0	1 58 32.8	12.5	181 31 31.3	4 51 47.1	12.5	231 21 48.8	4 25 34.1
13.0	141 12 13.5	2 28 44.0	13.0	187 55 2.4	5 2 47.0	13.0	238 12 33.4	4 5 35.8
13.5	147 13 53.8	+2 57 26.4	13.5	194 22 9.6	+5 10 3.8	13.5	245 5 56.1	+3 41 56.1
14.0	153 18 0.9	3 24 20.5	14.0	200 53 2.9	5 13 26.0	14.0	252 1 54.7	3 14 51.6
14.5	159 24 56.9	3 49 7.1	14.5	207 27 52.5	5 12 43.9	14.5	259 0 27.1	2 44 43.0
15.0	165 35 4.7	4 11 27.1	15.0	214 6 48.2	5 7 50.8	15.0	266 1 30.5	2 11 54.1
15.5	171 48 47.9	4 31 2.3	15.5	220 49 59.2	4 58 43.0	15.5	273 5 0.8	1 36 53.2
16.0	178 6 30.3	+4 47 35.1	16.0	227 37 33.1	+4 45 19.4	16.0	280 10 51.9	+1 0 11.3
16.5	184 28 35.8	5 0 48.0	16.5	234 29 35.9	4 27 42.9	16.5	287 18 54.2	+0 22 22.6
17.0	190 55 27.8	5 10 24.4	17.0	241 26 11.0	4 6 0.5	17.0	294 28 54.4	-0 15 56.3
17.5	197 27 28.0	5 16 9.3	17.5	248 27 18.1	3 40 23.5	17.5	301 40 34.3	0 54 6.9
18.0	204 4 56.3	5 17 48.7	18.0	255 32 52.4	3 11 8.5	18.0	308 53 30.2	1 31 29.9
18.5	210 48 9.5	+5 15 10.8	18.5	262 42 44.3	+2 38 37.0	18.5	316 7 13.5	-2 7 26.1
19.0	217 37 20.3	5 8 6.4	19.0	269 56 37.6	2 3 15.8	19.0	323 21 10.0	2 41 17.5
19.5	224 32 36.1	4 56 29.5	19.5	277 14 9.4	1 25 37.6	19.5	330 34 40.9	3 12 28.8
20.0	231 33 57.9	4 40 18.1	20.0	284 34 49.8	0 46 19.4	20.0	337 47 3.8	3 40 27.7
20.5	238 41 19.4	4 19 35.5	20.5	291 58 1.5	+0 6 2.4	20.5	344 57 34.2	4 4 47.7
21.0	245 54 26.1	+3 54 30.7	21.0	299 23 0.3	-0 34 28.4	21.0	352 5 27.0	-4 25 6.9
21.5	253 12 54.1	3 25 19.3	21.5	306 48 56.0	1 14 27.0	21.5	359 9 58.8	4 41 9.8
22.0	260 36 10.1	2 52 24.1	22.0	314 14 53.4	1 53 7.5	22.0	6 10 29.2	4 52 47.3
22.5	268 3 31.7	2 16 15.1	22.5	321 39 54.5	2 29 45.6	22.5	13 6 22.6	4 59 56.4
23.0	275 34 7.8	1 37 29.4	23.0	329 3 0.1	3 3 40.9	23.0	19 57 9.6	5 2 39.7
23.5	283 6 59.8	+0 56 49.8	23.5	336 23 12.4	-3 34 18.0	23.5	26 42 28.4	-5 1 4.9
24.0	290 41 3.4	+0 15 3.9	24.0	343 39 36.8	4 1 8.1	24.0	33 22 5.1	4 55 23.8
24.5	298 15 10.5	-0 26 57.8	24.5	350 51 24.5	4 23 49.2	24.5	39 55 53.8	4 45 51.4
25.0	305 48 12.2	1 8 24.4	25.0	357 57 53.8	4 42 6.3	25.0	46 23 56.9	4 32 45.4
25.5	313 19 0.7	1 48 26.6	25.5	4 58 31.4	4 55 51.8	25.5	52 46 24.2	4 16 24.4
26.0	320 46 32.0	-2 26 18.8	26.0	11 52 53.7	-5 5 4.3	26.0	59 3 32.5	-3 57 8.2
26.5	328 9 48.5	3 1 20.8	26.5	18 40 46.6	5 9 48.1	26.5	65 15 44.7	3 35 16.8
27.0	335 28 0.3	3 32 58.9	27.0	25 22 5.2	5 10 11.9	27.0	71 23 29.0	3 11 10.0
27.5	342 40 26.8	4 0 46.9	27.5	31 56 53.7	5 6 27.7	27.5	77 27 17.9	2 45 7.3
28.0	349 46 37.4	4 24 26.2	28.0	38 25 24.5	4 58 50.1	28.0	83 27 47.3	2 17 27.3
28.5	356 46 11.6	-4 43 45.1	28.5	44 47 56.7	-4 47 36.0	28.5	89 25 35.7	-1 48 28.1
29.0	3 38 58.8	4 58 37.9	29.0	51 4 55.3	4 33 2.8	29.0	95 21 23.3	1 18 27.7
29.5	10 24 58.1	5 9 4.6	29.5	57 16 50.4	4 15 27.8	29.5	101 15 51.4	0 47 43.2
30.0	17 4 16.6	5 15 9.9	30.0	63 24 15.3	3 55 8.4	30.0	107 9 41.7	-0 16 31.6
30.5	23 37 8.6	5 17 1.6	30.5	69 27 46.2	3 32 23.1	30.5	113 3 35.6	+0 14 50.3
31.0	30 3 54.3	-5 14 50.3	31.0	75 28 0.9	-3 7 28.7	31.0	118 58 13.7	+0 46 5.5
31.5	36 24 58.8	-5 8 48.5	31.5	81 25 38.4	-2 40 42.4	31.5	124 54 15.1	+1 16 56.3

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		Day of Month.	NOVEMBER.		Day of Month.	DECEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	118 58 13.7	+0 46 5.5	1.0	163 8 26.9	+4 12 8.9	1.0	196 43 27.3	+5 11 26.5
1.5	124 54 15.1	1 16 56.3	1.5	169 26 36.1	4 29 10.3	1.5	203 25 23.8	5 8 9.2
2.0	130 52 16.9	1 47 5.1	2.0	175 50 7.0	4 43 4.4	2.0	210 13 58.3	5 0 29.4
2.5	136 52 53.4	2 16 13.5	2.5	182 19 14.4	4 53 32.6	2.5	217 9 5.1	4 48 20.8
3.0	142 56 35.6	2 44 2.3	3.0	188 54 5.8	5 0 17.3	3.0	224 10 28.8	4 31 42.0
3.5	149 3 50.8	+3 10 11.8	3.5	195 34 41.0	+5 3 3.1	3.5	231 17 44.1	+4 10 37.5
4.0	155 15 1.7	3 34 21.8	4.0	202 20 51.6	5 1 37.3	4.0	238 30 16.2	3 45 18.2
4.5	161 30 26.1	3 56 12.0	4.5	209 12 21.2	4 55 50.8	4.5	245 47 22.1	3 16 2.5
5.0	167 50 16.7	4 15 21.7	5.0	216 8 45.9	4 45 38.8	5.0	253 8 11.4	2 43 15.7
5.5	174 14 40.1	4 31 31.1	5.5	223 9 34.6	4 31 2.2	5.5	260 31 47.7	2 7 30.1
6.0	180 43 37.7	+4 44 21.4	6.0	230 14 10.4	+4 12 7.6	6.0	267 57 11.5	+1 29 24.0
6.5	187 17 4.5	4 53 35.2	6.5	237 21 52.5	3 49 7.8	6.5	275 23 22.6	0 49 40.2
7.0	193 54 50.4	4 58 58.0	7.0	244 31 57.5	3 22 21.7	7.0	282 49 22.1	+0 9 4.4
7.5	200 36 39.8	5 0 17.9	7.5	251 43 41.2	2 52 13.8	7.5	290 14 14.6	-0 31 36.6
8.0	207 22 13.7	4 57 26.2	8.0	258 56 20.8	2 19 14.0	8.0	297 37 9.5	1 11 36.5
8.5	214 11 9.8	+4 50 18.7	8.5	266 9 15.8	+1 43 56.3	8.5	304 57 23.0	-1 50 11.9
9.0	221 3 3.5	4 38 56.6	9.0	273 21 49.8	1 6 57.5	9.0	312 14 18.3	2 26 42.9
9.5	227 57 28.6	4 23 25.2	9.5	280 33 31.7	+0 28 50.5	9.5	319 27 26.3	3 0 34.3
10.0	234 54 0.4	4 3 54.6	10.0	287 43 55.2	-0 9 27.3	10.0	326 36 25.4	3 31 16.4
10.5	241 52 15.0	3 40 39.8	10.5	294 52 39.4	0 47 35.3	10.5	333 41 1.0	3 58 25.0
11.0	248 51 50.4	+3 14 0.2	11.0	301 59 28.7	-1 24 49.8	11.0	340 41 4.7	-4 21 41.6
11.5	255 52 28.3	2 44 19.0	11.5	309 4 11.6	2 0 35.3	11.5	347 36 33.4	4 40 52.8
12.0	262 53 52.9	2 12 3.3	12.0	316 6 40.2	2 34 19.5	12.0	354 27 28.4	4 55 49.7
12.5	269 55 51.4	1 37 42.7	12.5	323 6 49.5	3 5 32.8	12.5	1 13 54.7	5 6 28.2
13.0	276 58 14.2	1 1 49.4	13.0	330 4 36.3	3 33 49.3	13.0	7 55 59.6	5 12 48.1
13.5	284 0 54.2	+0 24 56.9	13.5	336 59 58.1	-3 58 46.9	13.5	14 33 52.2	-5 14 52.5
14.0	291 3 45.5	-0 12 19.9	14.0	343 52 52.4	4 20 7.0	14.0	21 7 42.8	5 12 47.4
14.5	298 6 42.7	0 49 25.9	14.5	350 43 16.6	4 37 35.1	14.5	27 37 42.4	5 6 41.4
15.0	305 9 40.6	1 25 45.8	15.0	357 31 7.0	4 51 0.4	15.0	34 4 2.0	4 56 45.7
15.5	312 12 32.2	2 0 45.3	15.5	4 16 18.4	5 0 16.4	15.5	40 26 52.2	4 43 13.2
16.0	319 15 8.6	-2 33 51.6	16.0	10 58 44.8	-5 5 19.9	16.0	46 46 23.6	-4 26 19.1
16.5	326 17 18.2	3 4 33.3	16.5	17 38 19.5	5 6 12.1	16.5	53 2 46.6	4 6 19.9
17.0	333 18 46.0	3 32 22.1	17.0	24 14 54.8	5 2 57.3	17.0	59 16 11.3	3 43 33.3
17.5	340 19 13.5	3 56 53.0	17.5	30 48 22.4	4 55 43.6	17.5	65 26 47.1	3 18 18.5
18.0	347 18 19.3	4 17 44.2	18.0	37 18 34.8	4 44 42.0	18.0	71 34 43.5	2 50 55.4
18.5	354 15 39.0	-4 34 38.7	18.5	43 45 25.2	-4 30 6.6	18.5	77 40 10.8	-2 21 44.6
19.0	1 10 46.4	4 47 24.3	19.0	50 8 48.6	4 12 13.7	19.0	83 43 19.7	1 51 7.1
19.5	8 3 14.2	4 55 53.5	19.5	56 28 41.7	3 51 21.9	19.5	89 44 21.4	1 19 24.3
20.0	14 52 35.3	5 0 3.9	20.0	62 45 4.2	3 27 50.6	20.0	95 43 28.6	0 46 57.4
20.5	21 38 23.7	4 59 58.0	20.5	68 57 58.9	3 2 0.8	20.5	101 40 55.2	-0 14 7.3
21.0	28 20 16.7	-4 55 42.4	21.0	75 7 31.7	-2 34 14.2	21.0	107 36 56.6	+0 18 45.5
21.5	34 57 55.4	4 47 28.1	21.5	81 13 52.3	2 4 52.5	21.5	113 31 49.7	0 51 20.9
22.0	41 31 5.2	4 35 29.6	22.0	87 17 13.9	1 34 17.3	22.0	119 25 53.7	1 23 19.6
22.5	47 59 36.9	4 20 3.9	22.5	93 17 53.4	1 2 49.7	22.5	125 19 29.7	1 54 23.1
23.0	54 23 27.6	4 1 30.0	23.0	99 16 11.5	-0 30 50.2	23.0	131 13 0.7	2 24 13.4
23.5	60 42 39.9	-3 40 8.5	23.5	105 12 31.8	+0 1 21.4	23.5	137 6 51.9	+2 52 33.6
24.0	66 57 22.5	3 16 20.4	24.0	111 7 21.4	0 33 26.1	24.0	143 1 30.4	3 19 7.2
24.5	73 7 49.8	2 50 26.7	24.5	117 1 10.3	1 5 5.5	24.5	148 57 25.3	3 43 38.2
25.0	79 14 21.6	2 22 48.7	25.0	122 54 31.3	1 36 2.3	25.0	154 55 7.5	4 5 51.5
25.5	85 17 22.4	1 53 47.0	25.5	128 47 59.1	2 5 59.4	25.5	160 55 9.4	4 25 32.2
26.0	91 17 21.0	-1 23 41.7	26.0	134 42 10.5	+2 34 40.2	26.0	166 58 4.4	+4 42 25.8
26.5	97 14 50.2	0 52 51.7	26.5	140 37 44.1	3 1 48.5	26.5	173 4 26.6	4 56 17.9
27.0	103 10 25.5	-0 21 35.1	27.0	146 35 19.1	3 27 8.0	27.0	179 14 50.4	5 6 54.7
27.5	109 4 44.5	+0 9 50.2	27.5	152 35 34.8	3 50 22.4	27.5	185 29 49.5	5 14 2.8
28.0	114 58 26.7	0 41 7.1	28.0	158 39 10.2	4 11 15.3	28.0	191 49 56.6	5 17 29.4
28.5	120 52 13.9	+1 11 58.4	28.5	164 46 43.9	+4 29 30.0	28.5	198 15 41.6	+5 17 2.5
29.0	126 46 49.0	1 42 7.5	29.0	170 58 52.6	4 44 49.7	29.0	204 47 31.6	5 12 31.3
29.5	132 42 53.8	2 11 17.6	29.5	177 16 9.9	4 56 57.5	29.5	211 25 49.1	5 3 47.3
30.0	138 41 8.4	2 39 11.5	30.0	183 39 5.7	5 5 36.7	30.0	218 10 51.0	4 50 44.6
30.5	144 42 12.4	3 5 31.8	30.5	190 8 5.2	5 10 31.3	30.5	225 2 47.1	4 33 20.8
31.0	150 46 43.9	+3 30 0.6	31.0	196 43 27.3	+5 11 26.5	31.0	232 1 38.4	+4 11 38.0
31.5	156 55 18.4	+3 52 19.3	31.5	203 25 23.8	+5 8 9.2	31.5	239 7 17.3	+3 45 43.9

GREENWICH MEAN NOON.								
Date.	MOON'S EQUATOR.			$\Gamma'$ Longitude of the Moon's Perigee. Daily Motion, + 6'.684	$\Omega$ Mean Longitude of Moon's Ascending Node. Daily Motion, - 3'.177	$\epsilon$ Moon's Mean Longitude.	Mean Solar Days.	Motion of Moon in Mean Longitude.
	$i$ Inclination to the Earth's Equator.	$\Delta$ Ascending Node on Earth's Equator to Ascending Node on Ecliptic.	$\Omega'$ Ascending Node on Earth's Equator.					
Jan. 0	24 18.2	306 33.8	357 0.8	259 4.6	123 49.8	109 18.9	0.1	1 19.06
10	24 17.6	306 3.0	356 59.6	260 11.4	123 18.0	241 4.8	0.2	2 38.12
20	24 16.9	305 32.3	356 58.4	261 18.2	122 46.3	12 50.6	0.3	3 57.18
30	24 16.2	305 1.6	356 57.2	262 25.1	122 14.5	144 36.5	0.4	5 16.23
Feb. 9	24 15.5	304 30.9	356 56.1	263 31.9	121 42.7	276 22.3	0.5	6 35.29
							0.6	7 54.35
19	24 14.8	304 0.1	356 55.0	264 38.8	121 10.9	48 8.1	0.7	9 13.41
Mar. 1	24 14.2	303 29.4	356 53.9	265 45.6	120 39.2	179 54.0	0.8	10 32.47
11	24 13.5	302 58.7	356 52.8	266 52.4	120 7.4	311 39.8	0.9	11 51.53
21	24 12.8	302 27.9	356 51.7	267 59.3	119 35.6	83 25.6	1.0	13 10.58
31	24 12.1	301 57.2	356 50.6	269 6.1	119 3.9	215 11.5	2.0	26 21.17
Apr. 10	24 11.4	301 26.3	356 49.6	270 13.0	118 32.1	346 57.3	3.0	39 31.75
20	24 10.8	300 55.5	356 48.6	271 19.8	118 0.3	118 43.2	4.0	52 42.33
30	24 10.1	300 24.6	356 47.5	272 26.7	117 28.5	250 29.0	5.0	65 52.92
May 10	24 9.4	299 53.9	356 46.5	273 33.5	116 56.8	22 14.8	6.0	79 3.50
20	24 8.7	299 23.0	356 45.5	274 40.3	116 25.0	154 0.7	7.0	92 14.09
							8.0	105 24.67
30	24 7.9	298 52.1	356 44.5	275 47.2	115 53.2	285 46.5	9.0	118 35.25
June 9	24 7.2	298 21.2	356 43.5	276 54.0	115 21.4	57 32.3	10.0	131 45.84
19	24 6.5	297 50.3	356 42.6	278 0.9	114 49.7	189 18.2	Hours.	
29	24 5.8	297 19.4	356 41.6	279 7.7	114 17.9	321 4.0	1	0 32.94
July 9	24 5.1	296 48.4	356 40.7	280 14.6	113 46.1	92 49.9	2	1 5.88
							3	1 38.82
19	24 4.3	296 17.5	356 39.8	281 21.4	113 14.4	224 35.7	4	2 11.76
29	24 3.6	295 46.5	356 39.0	282 28.2	112 42.6	356 21.5	5	2 44.70
Aug. 8	24 2.8	295 15.5	356 38.1	283 35.1	112 10.8	128 7.4	6	3 17.65
18	24 2.1	294 44.5	356 37.2	284 41.9	111 39.0	259 53.2	7	3 50.59
28	24 1.3	294 13.6	356 36.4	285 48.8	111 7.3	31 39.0	8	4 23.53
							9	4 56.47
Sept. 7	24 0.5	293 42.6	356 35.6	286 55.6	110 35.5	163 24.9	10	5 29.41
17	23 59.8	293 11.6	356 34.8	288 2.5	110 3.7	295 10.7	11	6 2.35
27	23 59.0	292 40.6	356 34.0	289 9.3	109 32.0	66 56.6	12	6 35.29
Oct. 7	23 58.2	292 9.5	356 33.2	290 16.1	109 0.2	198 42.4	13	7 8.23
17	23 57.4	291 38.4	356 32.5	291 23.0	108 28.4	330 28.2	14	7 41.17
							15	8 14.11
27	23 56.6	291 7.3	356 31.7	292 29.8	107 56.6	102 14.1	16	8 47.06
Nov. 6	23 55.9	290 36.2	356 31.0	293 36.7	107 24.9	233 59.9	17	9 20.00
16	23 55.1	290 5.0	356 30.4	294 43.5	106 53.1	5 45.8	18	9 52.94
26	23 54.3	289 33.9	356 29.7	295 50.4	106 21.3	137 31.6	19	10 25.88
Dec. 6	23 53.5	289 2.7	356 29.0	296 57.2	105 49.5	269 17.4	20	10 58.82
							21	11 31.76
16	23 52.8	288 31.6	356 28.4	298 4.0	105 17.8	41 3.3	22	12 4.70
26	23 52.1	288 0.4	356 27.7	299 10.9	104 46.0	172 49.1	23	12 37.64
36	23 51.3	287 29.2	356 27.1	300 17.7	104 14.2	304 34.9		

# MOON'S LIBRATION. SUN'S ABERRATION AND PARALLAX. 285

QUANTITIES REQUIRED IN COMPUTING THE MOON'S LIBRATION.					SUN'S ABERRATION AND HORI- ZONTAL PARALLAX.		
ARGUMENT, ( $\Omega - \lambda$ ), or ( $\Omega - \lambda - 180^\circ$ ).					FOR GREENWICH MEAN NOON.		
$\Omega - \lambda$	$\mu$	$\frac{1}{A}$	$B$	$\Omega - \lambda$	Date.	Aberration. ( <i>Struve</i> .)	Hor. Par.
0			0 0.0	180	1907.	"	"
0	0.0	39	0 0.0	178	Jan. 0	— 20.79	8.95
2	0.0	39	0 3.1	176	10	20.78	8.95
4	0.1	39	0 6.2	174	20	20.77	8.94
6	0.2	39	0 9.3	172	30	20.75	8.93
8	0.2	39	0 12.4	170	Feb. 9	20.71	8.92
10	0.2	39	0 15.4	168	19	— 20.67	8.90
12	0.3	40	0 18.5	166	March 1	20.62	8.88
14	0.3	40	0 21.5	164	11	20.57	8.86
16	0.3	40	0 24.5	162	21	20.51	8.83
18	0.3	41	0 27.4	160	31	20.45	8.81
20	0.4	41	0 30.4	158	April 10	— 20.40	8.78
22	0.4	42	0 33.2	156	20	20.34	8.76
24	0.4	42	0 36.1	154	30	20.29	8.73
26	0.5	43	0 38.9	152	May 10	20.24	8.71
28	0.5	44	0 41.7	150	20	20.19	8.69
30	0.5	45	0 44.4	148	June 30	— 20.16	8.68
32	0.5	46	0 47.0	146	9	20.13	8.67
34	0.5	47	0 49.7	144	19	20.11	8.66
36	0.5	48	0 52.2	142	29	20.10	8.66
38	0.6	49	0 54.7	140	July 9	20.10	8.66
40	0.6	50	0 57.1	138	19	— 20.11	8.66
42	0.6	52	0 59.4	136	29	20.13	8.67
44	0.6	54	1 1.7	134	Aug. 8	20.16	8.68
46	0.6	56	1 3.9	132	18	20.19	8.69
48	0.6	58	1 6.0	130	28	20.24	8.71
50	0.6	60	1 8.0	128	Sept. 7	— 20.29	8.73
52	0.6	63	1 10.0	126	17	20.34	8.76
54	0.5	66	1 11.8	124	27	20.40	8.78
56	0.5	69	1 13.6	122	Oct. 7	20.46	8.81
58	0.5	73	1 15.3	120	17	20.51	8.83
60	0.5	77	1 16.9	118	Nov. 27	— 20.57	8.86
62	0.5	83	1 18.4	116	6	20.62	8.88
64	0.5	89	1 19.8	114	16	20.67	8.90
66	0.4	95	1 21.1	112	26	20.71	8.92
68	0.4	103	1 22.3	110	Dec. 6	20.75	8.93
70	0.4	113	1 23.4	108	16	— 20.77	8.94
72	0.4	125	1 24.4	106	26	20.78	8.95
74	0.3	141	1 25.3	104	36	— 20.79	8.95
76	0.3	160	1 26.1	102			
78	0.2	186	1 26.8	100			
80	0.2	222	1 27.4	98			
82	0.2	278	1 27.9	96			
84	0.1	370	1 28.3	94			
86	0.1	554	1 28.6	92			
88	0.0	1110	1 28.7	90			
90	0.0	$\infty$	1 28.8				
$\mu$ has the sign of $\tan (\lambda - \Omega)$ $A$ has the sign of $\cos (\Omega - \lambda)$ $B$ has the sign of $\sin (\Omega - \lambda)$ See formulæ, page 443.					Sun's Mean Equatorial Horizontal Parallax.  $8''.80$ ; $\log = 0.94448$ .		

## PRECESSION AND OBLIQUITY, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## FOR GREENWICH MEAN NOON.

Date.	Precession in Longitude from 1907.0.	Nutation.			Obliquity of Ecliptic. (Peters.)	Date.	Precession in Longitude from 1907.0.	Nutation.			Obliquity of Ecliptic. (Peters.)
		In Longi- tude.	In R. A.	In Obliq- uity.				In Longi- tude.	In R. A.	In Obliq- uity.	
					23° 26'						23° 26'
Jan. 0	- 0.14	- 14.11	- 0.865	- 5.62	58.88	July 4	+ 25.32	- 15.41	- 0.942	- 4.21	60.07
5	+ 0.55	13.94	0.854	5.55	58.95	9	26.01	15.27	0.933	4.13	60.15
10	1.24	13.79	0.844	5.47	59.03	14	26.70	15.15	0.925	4.03	60.24
15	1.93	13.66	0.836	5.37	59.12	19	27.39	15.05	0.919	3.92	60.34
20	2.61	13.56	0.829	5.26	59.23	24	28.07	14.97	0.915	3.80	60.45
25	+ 3.30	- 13.49	- 0.825	- 5.13	59.35	29	+ 28.76	- 14.92	- 0.913	- 3.68	60.56
30	3.99	13.46	0.823	4.99	59.48	Aug. 3	29.45	14.90	0.912	3.56	60.68
Feb. 4	4.68	13.47	0.823	4.86	59.60	8	30.14	14.93	0.913	3.43	60.81
9	5.37	13.52	0.826	4.73	59.73	13	30.83	15.00	0.916	3.29	60.93
14	6.05	13.61	0.831	4.60	59.85	18	31.51	15.09	0.922	3.16	61.06
19	+ 6.74	- 13.73	- 0.838	- 4.48	59.97	23	+ 32.20	- 15.20	- 0.930	- 3.04	61.18
24	7.43	13.88	0.848	4.36	60.08	28	32.89	15.35	0.939	2.93	61.29
Mar. 1	8.12	14.07	0.859	4.25	60.19	Sept. 2	33.58	15.53	0.949	2.82	61.38
6	8.81	14.28	0.872	4.15	60.28	7	34.27	15.73	0.961	2.72	61.47
11	9.49	14.51	0.887	4.07	60.35	12	34.95	15.95	0.975	2.64	61.55
16	+ 10.18	- 14.75	- 0.902	- 4.01	60.41	17	+ 35.64	- 16.18	- 0.990	- 2.57	61.61
21	10.87	15.00	0.918	3.96	60.45	22	36.33	16.42	1.005	2.51	61.66
26	11.56	15.26	0.934	3.92	60.48	27	37.02	16.66	1.020	2.47	61.69
31	12.25	15.50	0.949	3.91	60.49	Oct. 2	37.71	16.90	1.034	2.45	61.71
Apr. 5	12.94	15.74	0.963	3.91	60.48	7	38.40	17.13	1.047	2.44	61.71
10	+ 13.62	- 15.97	- 0.976	- 3.93	60.45	12	+ 39.08	- 17.34	- 1.060	- 2.45	61.70
15	14.31	16.17	0.989	3.96	60.42	17	39.77	17.53	1.072	2.47	61.68
20	15.00	16.34	0.999	3.99	60.38	22	40.46	17.69	1.082	2.50	61.64
25	15.69	16.48	1.007	4.03	60.33	27	41.15	17.81	1.090	2.54	61.59
30	16.38	16.59	1.014	4.08	60.27	Nov. 1	41.84	17.90	1.095	2.59	61.53
May 5	+ 17.06	- 16.66	- 1.018	- 4.14	60.21	6	+ 42.52	- 17.95	- 1.098	- 2.65	61.46
10	17.75	16.69	1.020	4.20	60.15	11	43.21	17.96	1.099	2.71	61.40
15	18.44	16.69	1.020	4.25	60.09	16	43.90	17.94	1.097	2.77	61.33
20	19.13	16.66	1.018	4.29	60.04	21	44.59	17.87	1.092	2.82	61.27
25	19.82	16.59	1.014	4.33	59.99	26	45.28	17.77	1.086	2.86	61.22
30	+ 20.50	- 16.49	- 1.009	- 4.36	59.95	Dec. 1	+ 45.96	- 17.64	- 1.078	- 2.89	61.19
June 4	21.19	16.37	1.002	4.38	59.93	6	46.65	17.47	1.068	2.91	61.17
9	21.88	16.24	0.993	4.39	59.92	11	47.34	17.28	1.056	2.91	61.16
14	22.57	16.09	0.983	4.38	59.92	16	48.03	17.08	1.044	2.90	61.16
19	23.26	15.92	0.973	4.36	59.94	21	48.72	16.86	1.031	2.87	61.18
24	+ 23.94	- 15.74	- 0.963	- 4.32	59.97	26	+ 49.41	- 16.64	- 1.017	- 2.83	61.22
29	24.63	15.57	0.953	4.27	60.01	31	50.09	16.42	1.004	2.77	61.28
July 4	+ 25.32	- 15.41	- 0.942	- 4.21	60.07	36	+ 50.78	- 16.21	- 0.992	- 2.69	61.35
Mean Obliquity, 1907.0.											
Peters . . . . .											23 27 4.51
Hansen . . . . .											23 27 4.74
Le Verrier . . . . .											23 27 4.70
Newcomb . . . . .											23 27 4.98
Precession for 1907 (Struve). 50.2654 log = 1.70127 Precession in a Solar day . . 0.1376 log = 9.13869 Precession in a Sidereal day . 0.1372 log = 9.13750											



## FOR GREENWICH MEAN NOON.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
Jan. 0	"	"	Feb. 15	"	"	Apr. 1	"	"	May 16	"	"
1	+ 0.04	- 0.07	16	+ 0.09	+ 0.08	2	- 0.22	+ 0.02	17	+ 0.02	- 0.07
2	0.10	0.06	17	+ 0.01	0.07	3	0.20	- 0.03	18	0.07	0.06
3	0.12	- 0.03	18	- 0.06	0.05	4	0.14	0.06	19	0.11	0.04
4	0.12	+ 0.01	19	0.11	+ 0.03	5	- 0.04	0.08	20	0.13	- 0.01
5	0.09	0.04	20	0.12	0.00	6	+ 0.07	0.08	21	0.11	+ 0.02
6	+ 0.02	0.07	21	0.11	- 0.03	7	0.16	0.06	22	+ 0.06	0.05
7	- 0.07	0.08	22	0.09	0.05	8	0.22	- 0.03	23	- 0.01	0.08
8	0.16	0.07	23	- 0.04	0.07	9	0.23	+ 0.01	24	0.10	0.09
9	0.22	0.05	24	+ 0.02	0.07	10	0.20	0.05	25	0.18	0.07
10	0.25	+ 0.01	25	0.07	0.07	11	0.13	0.07	26	0.23	+ 0.04
11	- 0.23	- 0.03	26	+ 0.11	- 0.05	12	+ 0.05	+ 0.08	27	- 0.24	0.00
12	0.16	0.06	27	0.14	- 0.02	13	- 0.04	0.07	28	0.20	- 0.04
13	- 0.05	0.08	28	0.13	+ 0.02	14	0.10	0.05	29	0.12	0.07
14	+ 0.07	0.08	29	0.09	0.05	15	0.13	+ 0.02	30	- 0.01	0.09
15	0.16	0.06	Mar. 1	+ 0.02	0.08	16	0.14	- 0.01	31	+ 0.11	0.08
16	0.22	- 0.03	2	- 0.07	0.09	17	0.12	0.04	1	0.20	0.05
17	0.24	+ 0.01	3	0.16	0.07	18	0.08	0.06	2	0.25	- 0.01
18	0.21	0.05	4	0.22	+ 0.04	19	- 0.03	0.07	3	0.25	+ 0.03
19	0.15	0.07	5	0.23	0.00	20	+ 0.03	0.07	4	0.21	0.06
20	+ 0.07	0.08	6	0.20	- 0.04	21	0.08	0.06	5	0.13	0.08
21	0.00	+ 0.07	7	- 0.13	- 0.07	22	+ 0.12	- 0.03	6	+ 0.04	+ 0.08
22	- 0.06	0.05	8	- 0.02	0.08	23	0.13	0.00	7	- 0.04	0.06
23	0.11	+ 0.02	9	+ 0.09	0.08	24	0.11	+ 0.03	8	0.10	0.04
24	0.13	- 0.01	10	0.17	0.05	25	+ 0.05	0.06	9	0.13	+ 0.01
25	0.11	0.04	11	0.21	- 0.01	26	- 0.03	0.08	10	0.13	- 0.02
26	0.08	0.06	12	0.21	+ 0.03	27	0.11	0.09	11	0.10	0.05
27	- 0.03	0.07	13	0.17	0.06	28	0.18	0.07	12	- 0.05	0.07
28	+ 0.03	0.07	14	0.10	0.07	29	0.23	+ 0.03	13	+ 0.01	0.07
29	0.09	0.06	15	+ 0.02	0.08	30	0.22	- 0.01	14	0.06	0.07
30	0.13	0.04	16	- 0.05	0.06	1	0.16	0.05	15	0.11	0.05
31	+ 0.14	- 0.01	17	- 0.10	+ 0.04	May 1	- 0.07	- 0.08	16	+ 0.13	- 0.02
Feb. 1	0.12	+ 0.03	18	0.13	+ 0.01	2	+ 0.04	0.09	17	0.12	+ 0.01
2	+ 0.06	0.06	19	0.13	- 0.02	3	0.15	0.07	18	0.08	0.04
3	- 0.02	0.08	20	0.10	0.05	4	0.22	- 0.04	19	+ 0.01	0.07
4	0.12	0.08	21	- 0.06	0.07	5	0.25	0.00	20	- 0.08	0.09
5	0.20	0.06	22	0.00	0.07	6	0.23	+ 0.04	21	0.16	0.08
6	0.24	+ 0.03	23	+ 0.05	0.07	7	0.17	0.07	22	0.23	0.06
7	0.24	+ 0.01	24	0.10	0.05	8	+ 0.08	0.08	23	0.26	+ 0.02
8	0.19	0.05	25	0.13	- 0.02	9	0.00	0.07	24	0.24	- 0.02
9	- 0.10	0.08	26	0.13	+ 0.01	10	- 0.07	0.06	25	0.17	0.06
10	+ 0.01	- 0.08	27	+ 0.10	+ 0.04	11	- 0.12	+ 0.03	26	- 0.06	- 0.08
11	0.12	0.07	28	+ 0.04	0.07	12	0.14	- 0.01	27	+ 0.06	0.09
12	0.20	- 0.04	29	- 0.04	0.09	13	0.13	0.04	28	0.16	0.07
13	0.23	0.00	30	0.12	0.08	14	0.09	0.06	29	0.23	- 0.03
14	0.21	+ 0.04	Apr. 1	0.19	0.05	15	- 0.04	0.07	30	0.25	+ 0.01
15	0.16	0.07	2	0.22	+ 0.02	16	+ 0.02	0.07	1	0.23	0.05
16	+ 0.09	+ 0.08	3	- 0.20	- 0.03	17	+ 0.07	- 0.06	2	+ 0.16	+ 0.07

# 288 TERMS OF SHORT PERIOD IN THE NUTATION, 1907.

## FOR GREENWICH MEAN NOON.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
July 1	+ 0.16	+ 0.07	Aug. 16	- 0.27	+ 0.01	Oct. 1	+ 0.13	- 0.05	Nov. 16	+ 0.02	+ 0.08
2	+ 0.08	0.08	17	0.23	- 0.04	2	0.15	- 0.03	17	- 0.07	0.07
3	- 0.01	0.07	18	0.16	0.07	3	0.15	0.00	18	0.12	+ 0.04
4	0.08	0.05	19	- 0.06	0.09	4	0.12	+ 0.04	19	0.14	0.00
5	0.11	+ 0.02	20	+ 0.06	0.08	5	+ 0.06	0.07	20	0.12	- 0.03
6	0.12	- 0.02	21	0.16	0.06	6	- 0.02	0.08	21	0.08	0.06
7	0.10	0.04	22	0.21	- 0.02	7	0.11	0.08	22	- 0.02	0.07
8	- 0.06	0.07	23	0.22	+ 0.03	8	0.19	0.06	23	+ 0.04	0.08
9	0.00	0.07	24	0.18	0.06	9	0.24	+ 0.03	24	0.09	0.07
10	+ 0.06	0.07	25	0.11	0.08	10	0.24	- 0.01	25	0.13	0.05
11	+ 0.11	- 0.06	26	+ 0.02	+ 0.08	11	- 0.19	- 0.05	26	+ 0.15	- 0.02
12	0.14	- 0.03	27	- 0.05	0.06	12	- 0.10	0.08	27	0.13	+ 0.02
13	0.14	0.00	28	0.10	+ 0.04	13	+ 0.01	0.09	28	0.09	0.05
14	0.11	+ 0.04	29	0.11	0.00	14	0.11	0.08	29	+ 0.02	0.08
15	+ 0.05	0.06	30	0.10	- 0.03	15	0.19	- 0.05	30	- 0.07	0.09
16	- 0.04	0.08	31	0.07	0.05	16	0.22	0.00	Dec. 1	0.16	0.08
17	0.14	0.08	Sept. 1	- 0.02	0.07	17	0.20	+ 0.04	2	0.23	0.06
18	0.22	0.06	2	+ 0.04	0.08	18	0.15	0.07	3	0.27	+ 0.02
19	0.26	+ 0.03	3	0.10	0.07	19	+ 0.07	0.08	4	0.25	- 0.03
20	0.26	- 0.01	4	0.14	0.05	20	- 0.02	0.08	5	0.18	0.06
21	- 0.21	- 0.05	5	+ 0.16	- 0.02	21	- 0.09	+ 0.06	6	- 0.07	- 0.09
22	0.12	0.08	6	0.15	+ 0.02	22	0.13	+ 0.02	7	+ 0.05	0.09
23	- 0.01	0.09	7	0.11	0.05	23	0.13	- 0.01	8	0.16	0.07
24	+ 0.11	0.08	8	+ 0.04	0.07	24	0.10	0.04	9	0.23	- 0.03
25	0.20	- 0.05	9	- 0.05	0.09	25	- 0.06	0.06	10	0.25	+ 0.01
26	0.24	0.00	10	0.14	0.08	26	0.00	0.07	11	0.22	0.05
27	0.23	+ 0.04	11	0.21	0.06	27	+ 0.06	0.08	12	0.15	0.08
28	0.18	0.07	12	0.25	+ 0.02	28	0.11	0.06	13	+ 0.06	0.08
29	0.10	0.08	13	0.24	- 0.03	29	0.14	0.04	14	- 0.03	0.07
30	+ 0.02	0.08	14	0.18	0.06	30	0.15	- 0.01	15	0.10	0.05
31	- 0.05	+ 0.06	15	- 0.09	- 0.09	31	+ 0.13	+ 0.03	16	- 0.13	+ 0.01
Aug. 1	0.10	+ 0.03	16	+ 0.03	0.09	Nov. 1	+ 0.07	0.06	17	0.12	- 0.02
2	0.11	- 0.01	17	0.13	0.07	2	0.00	0.08	18	0.09	0.05
3	0.10	0.04	18	0.19	- 0.03	3	- 0.09	0.09	19	- 0.04	0.07
4	0.06	0.06	19	0.21	+ 0.01	4	0.17	0.07	20	+ 0.03	0.08
5	- 0.01	0.07	20	0.18	0.05	5	0.23	+ 0.04	21	0.09	0.07
6	+ 0.05	0.07	21	0.12	0.07	6	0.25	0.00	22	0.13	0.05
7	0.10	0.06	22	+ 0.04	0.08	7	0.22	- 0.04	23	0.15	- 0.02
8	0.14	0.04	23	- 0.04	0.07	8	0.14	0.07	24	0.15	+ 0.01
9	0.15	- 0.01	24	0.10	0.05	9	- 0.03	0.09	25	0.11	0.04
10	+ 0.13	+ 0.03	25	- 0.12	+ 0.01	10	+ 0.09	- 0.08	26	+ 0.04	+ 0.07
11	+ 0.08	0.06	26	0.12	- 0.02	11	0.18	0.06	27	- 0.05	0.08
12	0.00	0.08	27	0.09	0.05	12	0.23	- 0.02	28	0.14	0.09
13	- 0.09	0.09	28	- 0.04	0.07	13	0.23	+ 0.02	29	0.22	0.07
14	0.18	0.08	29	+ 0.02	0.08	14	0.18	0.06	30	0.27	+ 0.03
15	0.25	0.05	30	0.08	0.07	15	0.11	0.08	31	0.28	- 0.01
16	- 0.27	+ 0.01	Oct. 1	+ 0.13	- 0.05	16	+ 0.02	+ 0.08	32	- 0.23	- 0.05

PART II

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ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON.

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS. USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF STRUVE AND PETERS.

NOTATION.

- $\tau$ , the time, reckoned in units of one year, from the beginning of the Besselian fictitious year, (1907, January 0<sup>d</sup>.795, Washington mean time),  
 $a_0, \delta_0$ , the star's mean right ascension and declination at the beginning of the fictitious year,  
 $\alpha, \delta$ , the star's apparent right ascension and declination at the time  $\tau$ ,  
 $\mu, \mu'$ , the annual proper motion in right ascension and declination,  
 $\odot$ , the Sun's true longitude,  
 $\Omega$ , the longitude of the Moon's ascending node,  
 $\omega$ , the obliquity of the ecliptic,
- $\Gamma$ , the longitude of the Sun's perigee,  
 $\Gamma'$ , the longitude of the Moon's perigee,  
 $\zeta$ , the Moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$\begin{aligned} A &= \tau - 0.342\ 54 \sin \Omega \\ &+ 0.004\ 10 \sin 2\ \Omega \\ &- 0.025\ 19 \sin 2\ \odot \\ &+ 0.002\ 93 \sin (\odot + 81^\circ\ 52') \\ &- 0.004\ 05 \sin 2\ \zeta \\ &+ 0.001\ 35 \sin (\zeta - \Gamma') \\ B &= - 9.2241 \cos \Omega \\ &+ 0.0895 \cos 2\ \Omega \\ &- 0.5506 \cos 2\ \odot \\ &- 0.0092 \cos (\odot + 281^\circ\ 20') \\ &- 0.0885 \cos 2\ \zeta \\ C &= - 20.4451 \cos \omega \cos \odot \\ D &= - 20.4451 \sin \odot \\ E &= - 0.0444 \sin \Omega + 0''.0014 \sin 2\ \Omega - 0''.0032 \sin 2\ \odot \end{aligned}$$

BESSEL'S Star-Constants.

$$\begin{aligned} a &= 3''.072\ 85 + 1''.336\ 77 \sin a_0 \tan \delta_0 = \text{precession in right ascension} \\ b &= \frac{1}{15} \cos a_0 \tan \delta_0 \\ c &= \frac{1}{15} \cos a_0 \sec \delta_0 \\ d &= \frac{1}{15} \sin a_0 \sec \delta_0 \\ a' &= 20''.0515 \cos a_0 = \text{precession in declination} \\ b' &= - \sin a_0 \\ c' &= \tan \omega \cos \delta_0 - \sin a_0 \sin \delta_0 \\ d' &= \cos a_0 \sin \delta_0 \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned} \alpha &= a_0 + \tau \mu + Aa + Bb + Cc + Dd + \frac{1}{15} E & (\text{in time}) \\ \delta &= \delta_0 + \tau \mu' + Aa' + Bb' + Cc' + Dd' & (\text{in arc}) \end{aligned}$$

INDEPENDENT STAR-NUMBERS.

$$\begin{aligned} f &= 46''.0928 A + E \text{ (in arc)} = 3''.072\ 85 A + \frac{1}{15} E & (\text{in time}) \\ f' &= 46''.0928 A' + E \text{ (in arc)} = 3''.072\ 85 A' + \frac{1}{15} E & (\text{in time}) \\ g \sin G &= B & g' \sin G' &= B' & h \sin H &= C \\ g \cos G &= 20''.0515 A & g' \cos G' &= 20''.0515 A' & h \cos H &= D & i &= C \tan \omega \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned} \alpha &= a_0 + f + \tau \mu + \frac{1}{15} g \sin (G + a_0) \tan \delta_0 + \frac{1}{15} h \sin (H + a_0) \sec \delta_0 \text{ (in time)} \\ \delta &= \delta_0 + \tau \mu' + g \cos (G + a_0) + h \cos (H + a_0) \sin \delta_0 + i \cos \delta_0 \text{ (in arc)} \end{aligned}$$

- NOTES.—(1) The quantities  $A'$ ,  $B'$ ,  $f'$ ,  $g'$ , and  $G'$  are to be used instead of  $A$ ,  $B$ ,  $f$ ,  $g$ , and  $G$  whenever it is necessary to omit the short period terms, as, for example, in computing the ephemeris of a star at ten-day intervals.
- (2) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.
- (3) In using the star-constants of the *British Association Catalogue*,  $a, b, c, d, a', b', c', d'$ , with the star-numbers of this Ephemeris, the quantities to be formed are  $Ac, Bd, Ca, Db, -Ac', -Bd', -Ca', -Db'$ .

# BESSELIAN STAR-NUMBERS, 1907.

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(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Jan. 0	-9.44442	+0.7538	-0.49764	+1.30440	Feb. 15	-9.16119	+0.6496	-1.19374	+1.05365
1	9.43838	0.7499	0.54076	1.30301	16	9.15984	0.6487	1.19873	1.04191
2	9.43350	0.7456	0.57087	1.30148	17	9.15721	0.6492	1.20353	1.02971
3	9.42975	0.7417	0.61562	1.29981	18	9.15256	0.6506	1.20813	1.01703
4	9.42682	0.7388	0.64852	1.29800	19	9.14554	0.6520	1.21256	1.00383
<sup>h</sup> (7.0) 5	-9.42421	+0.7373	-0.67897	+1.29604	<sup>h</sup> (10.0) 20	-9.13615	+0.6528	-1.21680	+0.99008
6	9.42129	0.7371	0.70731	1.29393	21	9.12496	0.6522	1.22087	0.97576
7	9.41747	0.7381	0.73377	1.29168	22	9.11294	0.6499	1.22477	0.96082
8	9.41231	0.7397	0.75859	1.28927	23	9.10133	0.6459	1.22849	0.94521
9	9.40560	0.7413	0.78194	1.28671	24	9.09132	0.6405	1.23205	0.92889
10	-9.39744	+0.7423	-0.80397	+1.28400	25	-9.08375	+0.6343	-1.23545	+0.91181
11	9.38817	0.7421	0.82480	1.28113	26	9.07900	0.6282	1.23869	0.89389
12	9.37845	0.7405	0.84454	1.27811	27	9.07675	0.6229	1.24177	0.87508
13	9.36895	0.7374	0.86329	1.27493	28	9.07606	0.6193	1.24469	0.85528
14	9.36032	0.7331	0.88113	1.27158	Mar. 1	9.07562	0.6176	1.24746	0.83441
15	-9.35315	+0.7281	-0.89814	+1.26807	2	-9.07394	+0.6177	-1.25008	+0.81235
16	9.34768	0.7231	0.91436	1.26440	3	9.07000	0.6193	1.25255	0.78898
17	9.34374	0.7187	0.92987	1.26055	4	9.06300	0.6216	1.25487	0.76416
18	9.34092	0.7155	0.94471	1.25654	5	9.05250	0.6237	1.25705	0.73770
19	9.33852	0.7138	0.95892	1.25235	6	9.03890	0.6247	1.25908	0.70940
<sup>h</sup> (8.0) 20	-9.33578	+0.7135	-0.97254	+1.24798	<sup>h</sup> (11.0) 7	-9.02317	+0.6242	-1.26097	+0.67899
21	9.33201	0.7143	0.98562	1.24343	8	9.00664	0.6218	1.26272	0.64616
22	9.32677	0.7155	0.99817	1.23869	9	8.99100	0.6177	1.26433	0.61052
23	9.31990	0.7166	1.01024	1.23377	10	8.97804	0.6124	1.26580	0.57157
24	9.31142	0.7168	1.02184	1.22865	11	8.96876	0.6066	1.26714	0.52866
25	-9.30196	+0.7156	-1.03300	+1.22333	12	-8.96346	+0.6012	-1.26834	+0.48091
26	9.29224	0.7129	1.04375	1.21781	13	8.96152	0.5970	1.26940	0.42713
27	9.28303	0.7087	1.05411	1.21208	14	8.96166	0.5947	1.27033	0.36563
28	9.27510	0.7035	1.06408	1.20614	15	8.96213	0.5945	1.27113	0.29385
29	9.26891	0.6977	1.07370	1.19998	16	8.96109	0.5962	1.27179	0.20771
30	-9.26449	+0.6921	-1.08297	+1.19360	17	-8.95713	+0.5991	-1.27233	+0.10005
31	9.26150	0.6875	1.09191	1.18698	18	8.94944	0.6024	1.27272	9.95651
Feb. 1	9.25930	0.6843	1.10054	1.18013	19	8.93777	0.6052	1.27299	9.74058
2	9.25701	0.6827	1.10886	1.17303	20	8.92267	0.6067	1.27313	+9.29208
3	9.25368	0.6826	1.11689	1.16567	21	8.90547	0.6065	1.27314	-9.19944
<sup>h</sup> (9.0) 4	-9.24864	+0.6835	-1.12464	+1.15805	<sup>h</sup> (12.0) 22	-8.88807	+0.6044	-1.27302	-9.70944
5	9.24142	0.6847	1.13212	1.15016	23	8.87227	0.6006	1.27276	9.93739
6	9.23203	0.6855	1.13934	1.14198	24	8.85992	0.5958	1.27238	0.08593
7	9.22081	0.6851	1.14630	1.13351	25	8.85205	0.5908	1.27187	0.19625
8	9.20855	0.6832	1.15302	1.12474	26	8.84868	0.5865	1.27122	0.28399
9	-9.19626	+0.6797	-1.15950	+1.11565	27	-8.84837	+0.5838	-1.27045	-0.35679
10	9.18504	0.6747	1.16574	1.10623	28	8.84899	0.5832	1.26954	0.41898
11	9.17574	0.6687	1.17177	1.09647	29	8.84831	0.5847	1.26851	0.47323
12	9.16897	0.6625	1.17758	1.08635	30	8.84404	0.5879	1.26734	0.52130
13	9.16468	0.6568	1.18317	1.07585	31	8.83461	0.5921	1.26605	0.56444
14	-9.16242	+0.6524	-1.18856	+1.06496	Apr. 1	-8.81908	+0.5964	-1.26462	-0.60355
15	-9.16119	+0.6496	-1.19374	+1.05365	2	-8.79741	+0.5999	-1.26305	-0.63928

E = - 0".04 = - 0".003

[Eph 07]

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
<b>Apr.</b>					<b>May</b>				
1	-8.81908	+0.5964	-1.26462	-0.60355	17	+8.66596	+0.6337	-1.01936	-1.22978
2	8.79741	0.5999	1.26305	0.63928	18	8.69276	0.6306	1.00829	1.23459
3	8.77048	0.6018	1.26136	0.67216	19	8.71155	0.6276	0.99681	1.23923
4	8.74036	0.6018	1.25953	0.70259	20	8.72436	0.6255	0.98490	1.24369
5	8.70952	0.5999	1.25756	0.73090	21	8.73368	0.6249	0.97253	1.24798
<sup>b</sup> (13.0)					<sup>h</sup> (16.0)				
6	-8.68133	+0.5966	-1.25546	-0.75734	22	+8.74280	+0.6262	-0.95968	-1.25211
7	8.65906	0.5925	1.25322	0.78213	23	8.75465	0.6292	0.94632	1.25608
8	8.64424	0.5886	1.25084	0.80545	24	8.77122	0.6334	0.93241	1.25990
9	8.63659	0.5856	1.24832	0.82744	25	8.79337	0.6381	0.91792	1.26355
10	8.63407	0.5845	1.24565	0.84825	26	8.82046	0.6425	0.90281	1.26705
11	-8.63327	+0.5855	-1.24285	-0.86797	27	+8.85065	+0.6458	-0.88704	-1.27040
12	8.63012	0.5885	1.23990	0.88670	28	8.88138	0.6475	0.87055	1.27360
13	8.62128	0.5929	1.23680	0.90453	29	8.91041	0.6473	0.85329	1.27656
14	8.60412	0.5980	1.23356	0.92152	30	8.93601	0.6454	0.83519	1.27958
15	8.57715	0.6028	1.23017	0.93774	31	8.95708	0.6423	0.81619	1.28236
16	-8.53970	+0.6065	-1.22662	-0.95324	<b>June</b>				
17	8.49276	0.6085	1.22292	0.96808	1	+8.97336	+0.6386	-0.79619	-1.28499
18	8.43933	0.6086	1.21906	0.98229	2	8.98525	0.6354	0.77510	1.28749
19	8.38399	0.6068	1.21504	0.99593	3	8.99370	0.6332	0.75281	1.28986
20	8.33224	0.6039	1.21086	1.00902	4	9.00026	0.6326	0.72919	1.29209
<sup>h</sup> (14.0)					<sup>h</sup> (17.0)				
21	-8.29048	+0.6004	-1.20652	-1.02160	5	9.00668	0.6339	0.70409	1.29419
22	8.26269	0.5974	1.20200	1.03369	6	+9.01444	+0.6367	-0.67733	-1.29615
23	8.24674	0.5957	1.19732	1.04533	7	9.02470	0.6405	0.64869	1.29799
24	8.23679	0.5958	1.19246	1.05653	8	9.03786	0.6445	0.61790	1.29970
25	8.22376	0.5980	1.18742	1.06732	9	9.05358	0.6479	0.58463	1.30128
26	-8.19756	+0.6019	-1.18220	-1.07773	10	9.07089	0.6500	0.54848	1.30273
27	8.14644	0.6070	1.17679	1.08776	11	+9.08849	+0.6504	-0.50892	-1.30406
28	8.05423	0.6124	1.17119	1.09744	12	9.10517	0.6489	0.46527	1.30526
29	7.89098	0.6172	1.16539	1.10678	13	9.11979	0.6458	0.41662	1.30634
30	-7.55145	0.6206	1.15939	1.11580	14	9.13169	0.6417	0.36169	1.30730
<b>May</b>					15	9.14082	0.6374	0.29868	1.30813
1	+6.99564	+0.6222	-1.15319	-1.12451	16	+9.14752	+0.6336	-0.22482	-1.30884
2	7.73878	0.6220	1.14677	1.13292	17	9.15262	0.6311	0.13564	1.30943
3	7.97955	0.6201	1.14013	1.14105	18	9.15718	0.6304	0.02317	1.30990
4	8.11025	0.6173	1.13326	1.14890	19	9.16239	0.6315	0.87086	1.31025
5	8.18724	0.6142	1.12616	1.15649	20	9.16926	0.6339	0.63410	1.31048
<sup>h</sup> (15.0)					<sup>h</sup> (18.0)				
6	+8.23249	+0.6118	-1.11882	-1.16383	21	+9.17834	+0.6371	-0.07340	-1.31058
7	8.25912	0.6109	1.11123	1.17091	22	9.18977	0.6403	+0.28730	1.31057
8	8.27784	0.6118	1.10338	1.17776	23	9.20309	0.6425	0.70403	1.31043
9	8.29842	0.6146	1.09526	1.18438	24	9.21745	0.6432	0.91263	1.31018
10	8.32777	0.6189	1.08687	1.19077	25	9.23182	0.6421	0.05285	1.30980
11	+8.36866	+0.6241	-1.07819	-1.19695	26	+9.24517	+0.6392	+0.15858	-1.30930
12	8.41963	0.6292	1.06921	1.20292	27	9.25672	0.6348	0.24344	1.30869
13	8.47625	0.6334	1.05992	1.20868	28	9.26605	0.6296	0.31429	1.30795
14	8.53301	0.6361	1.05030	1.21424	29	9.27312	0.6244	0.37509	1.30709
15	8.58524	0.6370	1.04035	1.21961	30	9.27832	0.6201	0.42831	1.30611
16	+8.63002	+0.6361	-1.03004	-1.22478	<b>July</b>				
17	+8.66596	+0.6337	-1.01936	-1.22978	1	+9.28228	+0.6173	+0.47561	-1.30500
					2	+9.28578	+0.6163	+0.51815	-1.30377

E = - 0".04 = - 0".003

# BESSELIAN STAR-NUMBERS, 1907.

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(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
July 1	+9.28228	+0.6173	+0.47561	-1.30500	Aug. 16	+9.50557	+0.5109	+1.17635	-1.08854
2	9.28578	0.6163	0.51815	1.30377	17	9.51092	0.5111	1.18172	1.07864
3	9.28972	0.6171	0.55679	1.30242	18	9.51675	0.5091	1.18690	1.06838
4	9.29480	0.6191	0.59215	1.30094	19	9.52250	0.5046	1.19191	1.05775
5	9.30140	0.6217	0.62475	1.29934	20	9.52772	0.4978	1.19673	1.04672
h (19.0) 6	+9.30955	+0.6239	+0.65496	-1.29761	h (22.0) 21	+9.53200	+0.4893	+1.20139	-1.03527
7	9.31886	0.6249	0.68309	1.29575	22	9.53513	0.4801	1.20587	1.02338
8	9.32871	0.6242	0.70940	1.29376	23	9.53712	0.4713	1.21019	1.01102
9	9.33834	0.6216	0.73410	1.29165	24	9.53821	0.4642	1.21435	0.99817
10	9.34707	0.6172	0.75735	1.28940	25	9.53874	0.4596	1.21835	0.98480
11	+9.35438	+0.6114	+0.77931	-1.28702	26	+9.53921	+0.4578	+1.22219	-0.97087
12	9.36005	0.6050	0.80009	1.28450	27	9.54010	0.4584	1.22587	0.95634
13	9.36418	0.5989	0.81981	1.28185	28	9.54175	0.4607	1.22941	0.94117
14	9.36713	0.5940	0.83856	1.27906	29	9.54432	0.4634	1.23279	0.92531
15	9.36948	0.5909	0.85643	1.27613	30	9.54775	0.4653	1.23603	0.90872
16	+9.37197	+0.5898	+0.87347	-1.27306	31	+9.55181	+0.4654	+1.23912	-0.89132
17	9.37528	0.5904	0.88975	1.26985	Sept. 1	9.55611	0.4629	1.24208	0.87307
18	9.37989	0.5921	0.90532	1.26649	2	9.56021	0.4577	1.24488	0.85387
19	9.38601	0.5941	0.92024	1.26298	3	9.56366	0.4502	1.24755	0.83364
20	9.39354	0.5954	0.93455	1.25932	4	9.56622	0.4412	1.25008	0.81228
h (20.0) 21	+9.40200	+0.5953	+0.94829	-1.25552	h (23.0) 5	+9.56783	+0.4319	+1.25248	-0.78968
22	9.41078	0.5932	0.96149	1.25155	6	9.56855	0.4236	1.25473	0.76569
23	9.41918	0.5890	0.97419	1.24743	7	9.56867	0.4175	1.25686	0.74014
24	9.42665	0.5830	0.98641	1.24314	8	9.56859	0.4144	1.25884	0.71286
25	9.43278	0.5758	0.99818	1.23869	9	9.56878	0.4145	1.26070	0.68360
26	+9.43735	+0.5683	+1.00953	-1.23407	10	+9.56965	+0.4170	+1.26243	-0.65207
27	9.44053	0.5615	1.02047	1.22927	11	9.57147	0.4209	1.26402	0.61792
28	9.44272	0.5562	1.03103	1.22430	12	9.57430	0.4249	1.26548	0.58070
29	9.44442	0.5530	1.04122	1.21915	13	9.57801	0.4276	1.26682	0.53983
30	9.44623	0.5520	1.05106	1.21381	14	9.58230	0.4279	1.26802	0.49455
31	+9.44868	+0.5527	+1.06057	-1.20828	15	+9.58677	+0.4254	+1.26910	-0.44383
Aug. 1	9.45212	0.5543	1.06976	1.20256	16	9.59092	0.4201	1.27005	0.38622
2	9.45667	0.5559	1.07865	1.19663	17	9.59438	0.4125	1.27088	0.31960
3	9.46219	0.5565	1.08724	1.19050	18	9.59692	0.4038	1.27157	0.24069
4	9.46832	0.5553	1.09555	1.18416	19	9.59849	0.3953	1.27214	0.14397
h (21.0) 5	+9.47452	+0.5519	+1.10358	-1.17759	h (0.0) 20	+9.59924	+0.3884	+1.27258	-0.01911
6	9.48025	0.5463	1.11135	1.17080	21	9.59943	0.3844	1.27290	9.84286
7	9.48507	0.5389	1.11887	1.16378	22	9.59944	0.3838	1.27309	-9.54088
8	9.48872	0.5305	1.12614	1.15651	23	9.59970	0.3863	1.27315	+7.26568
9	9.49118	0.5222	1.13318	1.14899	24	9.60058	0.3911	1.27309	9.54572
10	+9.49265	+0.5149	+1.13999	-1.14122	25	+9.60227	+0.3970	+1.27290	+9.84568
11	9.49353	0.5096	1.14657	1.13317	26	9.60477	0.4023	1.27258	0.02141
12	9.49435	0.5067	1.15294	1.12485	27	9.60791	0.4058	1.27213	0.14615
13	9.49564	0.5062	1.15909	1.11624	28	9.61142	0.4067	1.27156	0.24290
14	9.49782	0.5074	1.16504	1.10732	29	9.61492	0.4045	1.27085	0.32191
15	+9.50112	+0.5094	+1.17080	-1.09810	30	+9.61802	+0.3995	+1.27002	+0.38866
16	+9.50557	+0.5109	+1.17635	-1.08854	Oct. 1	+9.62043	+0.3926	+1.26905	+0.44643

E = - 0".04 = - 0".003

[Eph 07]

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Oct. 1	+ 9.62043	+ 0.3926	+ 1.26905	+ 0.44643	Nov. 16	+ 9.71468	+ 0.4309	+ 1.04540	+ 1.21693
2	9.62200	0.3850	1.26796	0.49733	17	9.71606	0.4369	1.03479	1.22244
3	9.62275	0.3782	1.26673	0.54280	18	9.71708	0.4444	1.02378	1.22775
4	9.62291	0.3736	1.26537	0.58386	19	9.72056	0.4521	1.01234	1.23287
h 5	9.62280	0.3722	1.26388	0.62127	h 20	9.72375	0.4588	1.00045	1.23779
(1.0) 6	+ 9.62282	+ 0.3742	+ 1.26225	+ 0.65562	(4.0) 21	+ 9.72737	+ 0.4633	+ 0.98808	+ 1.24253
7	9.62335	0.3793	1.26048	0.68735	22	9.73117	0.4652	0.97520	1.24708
8	9.62468	0.3863	1.25857	0.71681	23	9.73484	0.4643	0.96178	1.25146
9	9.62697	0.3937	1.25653	0.74429	24	9.73813	0.4610	0.94779	1.25566
10	9.63012	0.4000	1.25435	0.77003	25	9.74082	0.4563	0.93319	1.25969
11	+ 9.63392	+ 0.4041	+ 1.25202	+ 0.79421	26	+ 9.74287	+ 0.4514	+ 0.91793	+ 1.26355
12	9.63800	0.4054	1.24955	0.81701	27	9.74436	0.4475	0.90197	1.26724
13	9.64197	0.4036	1.24693	0.83856	28	9.74549	0.4457	0.88525	1.27076
14	9.64546	0.3992	1.24416	0.85898	29	9.74653	0.4466	0.86771	1.27413
15	9.64822	0.3933	1.24125	0.87836	30	9.74777	0.4501	0.84929	1.27733
16	+ 9.65016	+ 0.3872	+ 1.23818	+ 0.89680	Dec. 1	+ 9.74949	+ 0.4558	+ 0.82990	+ 1.28038
17	9.65132	0.3824	1.23496	0.91437	2	9.75186	0.4624	0.80945	1.28327
18	9.65191	0.3802	1.23158	0.93114	3	9.75491	0.4688	0.78784	1.28601
19	9.65227	0.3812	1.22804	0.94717	4	9.75858	0.4738	0.76495	1.28860
20	9.65276	0.3856	1.22434	0.96251	h 5	9.76263	0.4765	0.74063	1.29104
h (2.0) 21	+ 9.65371	+ 0.3925	+ 1.22048	+ 0.97721	(5.0) 6	+ 9.76679	+ 0.4764	+ 0.71472	+ 1.29333
22	9.65535	0.4008	1.21644	0.99131	7	9.77075	0.4737	0.68701	1.29547
23	9.65776	0.4089	1.21223	1.00485	8	9.77426	0.4689	0.65726	1.29747
24	9.66085	0.4154	1.20785	1.01785	9	9.77719	0.4631	0.62517	1.29932
25	9.66435	0.4195	1.20328	1.03036	10	9.77918	0.4574	0.59036	1.30102
26	+ 9.66795	+ 0.4206	+ 1.19853	+ 1.04240	11	+ 9.78126	+ 0.4529	+ 0.55236	+ 1.30259
27	9.67132	0.4189	1.19359	1.05400	12	9.78268	0.4508	0.51056	1.30401
28	9.67416	0.4149	1.18846	1.06516	13	9.78400	0.4514	0.46414	1.30529
29	9.67629	0.4098	1.18313	1.07593	14	9.78549	0.4545	0.41200	1.30643
30	9.67769	0.4051	1.17759	1.08631	15	9.78739	0.4594	0.35257	1.30744
31	+ 9.67852	+ 0.4020	+ 1.17185	+ 1.09633	16	+ 9.78981	+ 0.4649	+ 0.28352	+ 1.30830
Nov. 1	9.67902	0.4017	1.16589	1.10600	17	9.79276	0.4696	0.20121	1.30902
2	9.67953	0.4044	1.15971	1.11533	18	9.79612	0.4726	0.09937	1.30961
3	9.68041	0.4102	1.15331	1.12434	19	9.79968	0.4731	9.96588	1.31006
h 4	9.68193	0.4179	1.14667	1.13305	h 20	9.80319	0.4708	9.77192	1.31037
(3.0) 5	+ 9.68427	+ 0.4263	+ 1.13979	+ 1.14145	(6.0) 21	+ 9.80642	+ 0.4659	+ 9.41197	+ 1.31055
6	9.68742	0.4341	1.13265	1.14957	22	9.80917	0.4592	- 8.87602	1.31059
7	9.69122	0.4400	1.12526	1.15741	23	9.81136	0.4517	9.61126	1.31049
8	9.69538	0.4433	1.11761	1.16499	24	9.81302	0.4448	9.87034	1.31025
9	9.69958	0.4437	1.10967	1.17231	25	9.81427	0.4395	0.03142	1.30987
10	+ 9.70346	+ 0.4415	+ 1.10145	+ 1.17938	26	+ 9.81533	+ 0.4368	- 0.14856	+ 1.30936
11	9.70678	0.4374	1.09293	1.18620	27	9.81648	0.4368	0.24063	1.30871
12	9.70937	0.4327	1.08410	1.19279	28	9.81795	0.4393	0.31645	1.30792
13	9.71126	0.4287	1.07495	1.19915	29	9.81993	0.4432	0.38087	1.30699
14	9.71259	0.4266	1.06545	1.20529	30	9.82247	0.4473	0.43684	1.30592
15	+ 9.71362	+ 0.4273	+ 1.05561	+ 1.21122	31	+ 9.82555	+ 0.4503	- 0.48629	+ 1.30472
16	+ 9.71468	+ 0.4309	+ 1.04540	+ 1.21693	32	+ 9.82900	+ 0.4512	- 0.53057	+ 1.30337

$$E = - 0''.04 = - 0''.003$$



(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
Jan.	y	s	s	°	h m	°	h m	°	h m			"	
	0	-0.0008	-0.857	-0.865	134 31.2	8 58.1	351 7.9	23 24.5	+0.90075	+1.30962	-1.36	-0.1349	
	1	+0.0019	0.846	0.855	134 23.1	8 57.5	350 11.5	23 20.8	0.89575	1.30941	1.51	0.1780	
	2	0.0047	0.836	0.844	134 20.7	8 57.4	349 15.1	23 17.0	0.89119	1.30917	1.65	0.2171	
	3	0.0074	0.829	0.834	134 21.1	8 57.4	348 18.6	23 13.2	0.88738	1.30892	1.79	0.2529	
	h (7.0)	4	0.0101	0.823	0.823	134 21.0	8 57.4	347 22.0	23 9.5	0.88447	1.30864	1.93	0.2858
	5	0.0129	-0.818	-0.813	134 16.8	8 57.1	346 25.3	23 5.7	+0.88241	+1.30835	-2.07	-0.3162	
	6	0.0156	0.813	0.802	134 5.9	8 56.4	345 28.6	23 1.9	0.88090	1.30804	2.21	0.3446	
	7	0.0184	0.806	0.792	133 47.0	8 55.1	344 31.8	22 58.1	0.87957	1.30770	2.35	0.3710	
	8	0.0211	0.796	0.781	133 20.1	8 53.3	343 34.9	22 54.3	0.87796	1.30735	2.49	0.3959	
	9	0.0238	0.784	0.771	132 47.2	8 51.1	342 37.9	22 50.5	0.87568	1.30698	2.63	0.4192	
	10	0.0266	-0.770	-0.761	132 11.2	8 48.7	341 40.8	22 46.7	+0.87251	+1.30659	-2.76	-0.4412	
	11	0.0293	0.754	0.751	131 35.4	8 46.4	340 43.6	22 42.9	0.86828	1.30618	2.90	0.4621	
	12	0.0320	0.737	0.741	131 3.8	8 44.3	339 46.3	22 39.1	0.86312	1.30576	3.03	0.4818	
	13	0.0348	0.721	0.731	130 38.7	8 42.6	338 48.9	22 35.3	0.85727	1.30532	3.17	0.5006	
	14	0.0375	0.707	0.721	130 21.8	8 41.5	337 51.3	22 31.4	0.85114	1.30486	3.30	0.5184	
	15	0.0403	-0.695	-0.711	130 13.3	8 40.9	336 53.7	22 27.6	+0.84524	+1.30439	-3.43	-0.5354	
	16	0.0430	0.687	0.701	130 11.5	8 40.8	335 55.9	22 23.7	0.84004	1.30390	3.56	0.5516	
	17	0.0457	0.680	0.692	130 13.2	8 40.9	334 58.0	22 19.9	0.83584	1.30339	3.69	0.5671	
	18	0.0485	0.676	0.682	130 14.7	8 41.0	334 0.0	22 16.0	0.83281	1.30288	3.82	0.5820	
	h (8.0)	19	0.0512	0.672	0.672	130 12.0	8 40.8	333 1.9	0.83080	1.30235	3.95	0.5962	
	20	0.0540	-0.668	-0.663	130 2.4	8 40.2	332 3.7	22 8.2	+0.82949	+1.30180	-4.07	-0.6098	
	21	0.0567	0.662	0.654	129 44.6	8 39.0	331 5.3	22 4.4	0.82840	1.30124	4.20	0.6229	
	22	0.0594	0.654	0.644	129 19.4	8 37.3	330 6.7	22 0.4	0.82704	1.30067	4.32	0.6354	
	23	0.0622	0.644	0.635	128 48.6	8 35.2	329 8.0	21 56.5	0.82495	1.30009	4.44	0.6475	
	24	0.0649	0.632	0.626	128 15.2	8 33.0	328 9.2	21 52.6	0.82179	1.29950	4.56	0.6591	
	25	0.0676	-0.618	-0.617	127 43.3	8 30.9	327 10.3	21 48.7	+0.81748	+1.29890	-4.68	-0.6703	
	26	0.0704	0.605	0.608	127 16.5	8 29.1	326 11.2	21 44.7	0.81218	1.29829	4.80	0.6810	
	27	0.0731	0.592	0.599	126 57.4	8 27.8	325 11.9	21 40.8	0.80615	1.29767	4.91	0.6914	
	28	0.0758	0.581	0.591	126 47.4	8 27.2	324 12.5	21 36.9	0.79992	1.29704	5.03	0.7014	
	29	0.0786	0.573	0.581	126 45.8	8 27.1	323 12.9	21 32.9	0.79399	1.29641	5.14	0.7110	
	30	0.0813	-0.567	-0.573	126 50.2	8 27.3	322 13.2	21 28.9	+0.78884	+1.29577	-5.25	-0.7202	
	31	0.0841	0.564	0.565	126 56.4	8 27.8	321 13.3	21 24.9	0.78481	1.29513	5.36	0.7292	
Feb.	1	0.0868	0.561	0.556	127 0.2	8 28.0	320 13.3	21 20.9	0.78196	1.29448	5.47	0.7378	
	2	0.0895	0.558	0.548	126 57.4	8 27.8	319 13.0	21 16.9	0.78014	1.29382	5.58	0.7462	
	h (9.0)	3	0.0923	0.554	0.540	126 45.1	8 27.0	318 12.6	0.77888	1.29316	5.68	0.7542	
	4	0.0950	-0.547	-0.532	126 22.6	8 25.5	317 12.1	21 8.8	+0.77767	+1.29250	-5.78	-0.7619	
	5	0.0978	0.538	0.524	125 50.9	8 23.4	316 11.4	21 4.8	0.77595	1.29184	5.88	0.7694	
	6	0.1005	0.527	0.516	125 13.0	8 20.9	315 10.5	21 0.7	0.77326	1.29118	5.98	0.7766	
	7	0.1032	0.513	0.508	124 32.6	8 18.2	314 9.4	20 56.6	0.76935	1.29052	6.08	0.7836	
	8	0.1060	0.499	0.501	123 54.4	8 15.6	313 8.2	20 52.5	0.76418	1.28985	6.17	0.7903	
	9	0.1087	-0.485	-0.493	123 22.6	8 13.5	312 6.8	20 48.4	+0.75795	+1.28919	-6.26	-0.7968	
	10	0.1114	0.473	0.486	123 0.0	8 12.0	311 5.2	20 44.3	0.75108	1.28854	6.35	0.8030	
	11	0.1142	0.463	0.478	122 48.0	8 11.2	310 3.5	20 40.2	0.74413	1.28788	6.44	0.8090	
	12	0.1169	0.456	0.471	122 46.0	8 11.1	309 1.6	20 36.1	0.73775	1.28723	6.53	0.8148	
	13	0.1197	0.451	0.464	122 51.0	8 11.4	307 59.5	20 32.0	0.73247	1.28659	6.61	0.8204	
	14	0.1224	-0.449	-0.457	122 58.9	8 11.9	306 57.3	20 27.8	+0.72868	+1.28595	-6.70	-0.8258	
	15	0.1251	-0.448	-0.450	123 4.3	8 12.3	305 54.9	20 23.7	+0.72645	+1.28532	-6.78	-0.8310	

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	$y$	$s$	$s$	$s$	$^{\circ}$	$h$ $m$	$^{\circ}$	$h$ $m$					
Feb.	15	0.1251	-0.448	-0.450	123 4.3	8 12.3	305 54.9	20 23.7	+0.72645	+1.28532	-6.78	-0.8310	
	16	0.1279	-0.446	-0.443	123 2.9	8 12.2	304 52.4	20 19.5	0.72530	1.28470	6.86	0.8360	
	17	0.1306	-0.444	-0.436	122 51.5	8 11.4	303 49.7	20 15.3	0.72490	1.28408	6.93	0.8408	
	18	0.1334	-0.439	-0.429	122 29.8	8 10.0	302 46.9	20 11.1	0.72453	1.28347	7.00	0.8454	
	h (10.0) 19	0.1361	-0.432	-0.423	121 59.5	8 8.0	301 43.9	20 6.9	0.72358	1.28288	7.08	0.8498	
	20	0.1388	-0.423	-0.416	121 23.5	8 5.6	300 40.9	20 2.7	+0.72154	+1.28229	-7.15	-0.8541	
	21	0.1416	-0.412	-0.410	120 46.5	8 3.1	299 37.6	19 58.5	0.71812	1.28172	7.21	0.8581	
	22	0.1443	-0.401	-0.403	120 12.9	8 0.9	298 34.3	19 54.3	0.71330	1.28116	7.28	0.8620	
	23	0.1470	-0.390	-0.397	119 46.9	7 59.1	297 30.8	19 50.1	0.70739	1.28062	7.34	0.8658	
	24	0.1498	-0.382	-0.390	119 31.3	7 58.1	296 27.2	19 45.8	0.70084	1.28009	7.40	0.8693	
	25	0.1525	-0.375	-0.384	119 26.5	7 57.8	295 23.4	19 41.6	+0.69435	+1.27957	-7.46	-0.8727	
Mar.	26	0.1552	-0.371	-0.378	119 31.2	7 58.1	294 19.6	19 37.3	0.68855	1.27907	7.52	0.8760	
	27	0.1580	-0.369	-0.372	119 41.3	7 58.8	293 15.6	19 33.0	0.68405	1.27858	7.57	0.8790	
	28	0.1607	-0.368	-0.366	119 51.4	7 59.4	292 11.5	19 28.8	0.68113	1.27811	7.62	0.8820	
	1	0.1635	-0.368	-0.360	119 55.7	7 59.7	291 7.4	19 24.5	0.67973	1.27766	7.67	0.8847	
	2	0.1662	-0.367	-0.354	119 49.4	7 59.3	290 3.1	19 20.2	+0.67944	+1.27723	-7.72	-0.8873	
	3	0.1689	-0.364	-0.349	119 30.6	7 58.0	288 58.7	19 15.9	0.67966	1.27682	7.76	0.8898	
	4	0.1717	-0.358	-0.343	118 59.4	7 56.0	287 54.2	19 11.6	0.67973	1.27643	7.80	0.8921	
	5	0.1744	-0.349	-0.337	118 17.5	7 53.2	286 49.7	19 7.3	0.67890	1.27605	7.84	0.8943	
	h (11.0) 6	0.1772	-0.339	-0.332	117 29.5	7 50.0	285 45.0	19 3.0	0.67675	1.27570	7.88	0.8963	
	7	0.1799	-0.327	-0.326	116 40.7	7 46.7	284 40.3	18 58.7	+0.67308	+1.27537	-7.91	-0.8982	
	8	0.1826	-0.315	-0.320	115 56.2	7 43.7	283 35.6	18 54.4	0.66794	1.27506	7.94	0.9000	
h (12.0)	9	0.1854	-0.304	-0.315	115 20.5	7 41.4	282 30.7	18 50.1	0.66168	1.27477	7.97	0.9016	
	10	0.1881	-0.295	-0.309	114 57.3	7 39.8	281 25.8	18 45.7	0.65499	1.27451	8.00	0.9031	
	11	0.1908	-0.289	-0.304	114 46.8	7 39.1	280 20.9	18 41.4	0.64854	1.27426	8.02	0.9044	
	12	0.1936	-0.285	-0.299	114 47.2	7 39.1	279 15.9	18 37.1	+0.64315	+1.27404	-8.05	-0.9056	
	13	0.1963	-0.284	-0.293	114 53.9	7 39.6	278 10.9	18 32.7	0.63937	1.27385	8.07	0.9067	
	14	0.1991	-0.284	-0.288	115 1.3	7 40.1	277 5.9	18 28.4	0.63750	1.27368	8.08	0.9076	
	15	0.2018	-0.284	-0.282	115 3.4	7 40.2	276 0.9	18 24.1	0.63741	1.27353	8.10	0.9084	
	16	0.2045	-0.284	-0.277	114 55.2	7 39.7	274 55.9	18 19.7	0.63860	1.27341	8.11	0.9091	
	17	0.2073	-0.281	-0.272	114 34.4	7 38.3	273 50.9	18 15.4	+0.64032	+1.27331	-8.12	-0.9096	
	18	0.2100	-0.276	-0.267	114 1.8	7 36.1	272 45.9	18 11.1	0.64178	1.27323	8.13	0.9100	
	19	0.2128	-0.269	-0.261	113 19.6	7 33.3	271 40.9	18 6.7	0.64226	1.27318	8.13	0.9103	
h (12.0)	20	0.2155	-0.260	-0.256	112 32.4	7 30.2	270 35.9	18 2.4	0.64125	1.27315	8.14	0.9104	
	21	0.2182	-0.250	-0.251	111 45.5	7 27.0	269 31.0	17 58.1	0.63862	1.27315	8.14	0.9104	
	22	0.2210	-0.240	-0.245	111 4.5	7 24.3	268 26.1	17 53.7	+0.63443	+1.27318	-8.13	-0.9103	
	23	0.2237	-0.232	-0.240	110 32.9	7 22.2	267 21.3	17 49.4	0.62913	1.27322	8.13	0.9100	
	24	0.2264	-0.225	-0.235	110 13.4	7 20.9	266 16.5	17 45.1	0.62338	1.27330	8.12	0.9096	
	25	0.2292	-0.221	-0.230	110 6.0	7 20.4	265 11.8	17 40.8	0.61806	1.27339	8.11	0.9091	
	26	0.2319	-0.220	-0.224	110 8.3	7 20.6	264 7.2	17 36.5	0.61393	1.27351	8.10	0.9085	
	27	0.2346	-0.220	-0.219	110 14.5	7 21.0	263 2.7	17 32.2	+0.61152	+1.27366	-8.09	-0.9077	
	28	0.2374	-0.220	-0.213	110 17.6	7 21.2	261 58.2	17 27.9	0.61103	1.27382	8.07	0.9068	
	29	0.2401	-0.219	-0.208	110 12.0	7 20.8	260 53.9	17 23.6	0.61226	1.27401	8.05	0.9058	
	30	0.2429	-0.217	-0.203	109 52.8	7 19.5	259 49.6	17 19.3	0.61462	1.27423	8.03	0.9046	
Apr.	31	0.2456	-0.213	-0.197	109 18.8	7 17.3	258 45.4	17 15.0	0.61729	1.27446	8.00	0.9033	
	1	0.2483	-0.205	-0.192	108 30.7	7 14.0	257 41.3	17 10.8	+0.61950	+1.27472	-7.98	-0.9019	
	2	0.2511	-0.195	-0.186	107 32.2	7 10.1	256 37.4	17 6.5	+0.62053	+1.27500	-7.95	-0.9003	

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
		y	s	s	°	h m	°	h m					
Apr.	1	0.2483	-0.205	-0.192	108 30.7	7 14.0	257 41.3	17 10.8	+0.61950	+1.27472	-7.98	-0.9019	
	2	0.2511	0.195	0.186	107 32.2	7 10.1	256 37.4	17 6.5	0.62053	1.27500	7.95	0.9003	
	3	0.2538	0.184	0.181	106 28.4	7 5.9	255 33.6	17 2.2	0.61998	1.27530	7.92	0.8986	
	4	0.2566	0.172	0.175	105 25.4	7 1.7	254 29.9	16 58.0	0.61774	1.27562	7.89	0.8968	
	h	5	0.2593	0.160	0.170	104 28.2	6 57.9	253 26.3	16 53.8	0.61393	1.27596	7.85	0.8948
	(18.0)	6	0.2620	-0.150	-0.164	103 41.8	6 54.8	252 22.8	16 49.5	+0.60914	+1.27632	-7.81	-0.8927
	7	0.2648	0.143	0.158	103 9.3	6 52.6	251 19.5	16 45.3	0.60407	1.27671	7.77	0.8905	
	8	0.2675	0.138	0.152	102 50.4	6 51.4	250 16.3	16 41.1	0.59957	1.27710	7.73	0.8881	
	9	0.2702	0.136	0.147	102 42.4	6 50.8	249 13.3	16 36.9	0.59642	1.27752	7.68	0.8856	
	10	0.2730	0.135	0.141	102 40.0	6 50.7	248 10.5	16 32.7	0.59521	1.27796	7.64	0.8829	
	11	0.2757	-0.135	-0.135	102 37.0	6 50.5	247 7.8	16 28.5	+0.59610	+1.27841	-7.59	-0.8801	
	12	0.2785	0.134	0.129	102 26.7	6 49.8	246 5.2	16 24.3	0.59878	1.27888	7.54	0.8772	
	13	0.2812	0.131	0.123	102 4.9	6 48.3	245 2.9	16 20.2	0.60264	1.27936	7.48	0.8741	
	14	0.2839	0.126	0.117	101 29.7	6 46.0	244 0.7	16 16.0	0.60681	1.27986	7.43	0.8708	
	15	0.2867	0.119	0.111	100 42.2	6 42.8	242 58.7	16 11.9	0.61044	1.28037	7.37	0.8674	
	16	0.2894	-0.109	-0.104	99 45.3	6 39.0	241 56.9	16 7.8	+0.61285	+1.28089	-7.31	-0.8639	
	17	0.2922	0.098	0.098	98 43.9	6 34.9	240 55.3	16 3.7	0.61357	1.28143	7.25	0.8602	
	18	0.2949	0.087	0.092	97 44.0	6 30.9	239 53.8	15 59.6	0.61255	1.28198	7.18	0.8563	
	19	0.2976	0.077	0.085	96 50.7	6 27.4	238 52.6	15 55.5	0.60995	1.28254	7.12	0.8523	
	h	20	0.3004	0.069	0.079	96 7.4	6 24.5	237 51.6	15 51.4	0.60634	1.28311	7.05	0.8481
	(14.0)	21	0.3031	-0.063	-0.072	95 36.6	6 22.4	236 50.7	15 47.4	+0.60251	+1.28369	-6.98	-0.8438
	22	0.3058	0.059	0.065	95 18.0	6 21.2	235 50.1	15 43.3	0.59929	1.28428	6.91	0.8393	
	23	0.3086	0.057	0.058	95 7.8	6 20.5	234 49.7	15 39.3	0.59744	1.28487	6.83	0.8346	
	24	0.3113	0.056	0.051	95 0.9	6 20.1	233 49.6	15 35.3	0.59748	1.28548	6.76	0.8297	
	25	0.3140	0.054	0.044	94 50.5	6 19.4	232 49.6	15 31.3	0.59953	1.28609	6.68	0.8247	
	26	0.3168	-0.051	-0.037	94 31.1	6 18.1	231 49.6	15 27.3	+0.60329	+1.28670	-6.60	-0.8195	
	27	0.3195	0.046	0.030	93 58.3	6 15.9	230 49.9	15 23.3	0.60809	1.28732	6.52	0.8141	
	28	0.3223	0.038	0.023	93 10.5	6 12.7	229 50.5	15 19.4	0.61311	1.28794	6.43	0.8085	
	29	0.3250	0.027	0.016	92 9.4	6 8.6	228 51.3	15 15.4	0.61752	1.28857	6.35	0.8027	
	30	0.3277	-0.014	0.008	90 58.7	6 3.9	227 52.2	15 11.5	0.62070	1.28920	6.26	0.7967	
May	1	0.3305	0.000	-0.001	89 43.7	5 58.9	226 53.4	15 7.6	+0.62225	+1.28984	-6.17	-0.7905	
	2	0.3332	+0.014	+0.006	88 29.8	5 54.0	225 54.8	15 3.7	0.62215	1.29047	6.08	0.7840	
	3	0.3360	0.026	0.014	87 22.4	5 49.5	224 56.3	14 59.8	0.62060	1.29110	5.99	0.7774	
	4	0.3387	0.037	0.022	86 25.8	5 45.7	223 58.1	14 55.9	0.61810	1.29174	5.90	0.7705	
	h	5	0.3414	0.044	0.030	85 42.6	5 42.8	223 0.0	0.61538	1.29237	5.80	0.7634	
	(15.0)	6	0.3442	+0.050	+0.038	85 12.9	5 40.9	222 2.2	0.61334	+1.29300	-5.70	-0.7561	
	7	0.3469	0.053	0.046	84 54.1	5 39.6	221 4.5	14 44.3	0.61258	1.29363	5.60	0.7485	
	8	0.3496	0.055	0.054	84 41.4	5 38.8	220 7.0	14 40.5	0.61363	1.29425	5.50	0.7406	
	9	0.3524	0.058	0.062	84 28.2	5 37.9	219 9.7	14 36.6	0.61664	1.29488	5.40	0.7325	
	10	0.3551	0.063	0.070	84 8.7	5 36.6	218 12.6	14 32.8	0.62122	1.29549	5.30	0.7241	
	11	0.3579	+0.069	+0.078	83 38.8	5 34.6	217 15.7	14 29.0	+0.62679	+1.29610	-5.19	-0.7155	
	12	0.3606	0.078	0.087	82 56.7	5 31.8	216 19.0	14 25.3	0.63252	1.29671	5.09	0.7065	
	13	0.3633	0.089	0.095	82 3.1	5 28.2	215 22.4	14 21.5	0.63763	1.29731	4.98	0.6972	
	14	0.3661	0.102	0.104	81 0.9	5 24.1	214 26.0	14 17.7	0.64151	1.29790	4.87	0.6876	
	15	0.3688	0.115	0.112	79 54.5	5 19.6	213 29.8	14 14.0	0.64380	1.29849	4.76	0.6776	
	16	0.3715	+0.128	+0.121	78 48.9	5 15.3	212 33.8	14 10.3	+0.64441	+1.29906	-4.65	-0.6673	
	17	0.3743	+0.140	+0.130	77 48.8	5 11.3	211 38.0	14 6.5	+0.64362	+1.29963	-4.54	-0.6566	

## INDEPENDENT STAR-NUMBERS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f$	$f'$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	°	h m	°	h m			"	
May	17	0.3743	+0.140	+0.130	77 48.8	5 11.3	211 38.0	14 6.5	+0.64362	+1.29963	-4.54	-0.6566
	18	0.3770	0.149	0.139	76 58.4	5 7.9	210 42.3	14 2.8	0.64194	1.30019	4.42	0.6456
	19	0.3798	0.155	0.148	76 19.6	5 5.3	209 46.8	13 59.1	0.64009	1.30074	4.31	0.6341
	20	0.3825	0.160	0.157	75 52.0	5 3.5	208 51.5	13 55.4	0.63883	1.30128	4.19	0.6222
	21	0.3852	0.163	0.166	75 33.3	5 2.2	207 56.3	13 51.8	0.63885	1.30180	4.07	0.6098
	(16.0)	22	0.3880	+0.167	+0.175	75 18.2	5 1.2	207 1.3	+0.64060	+1.30231	-3.95	-0.5970
	23	0.3907	0.172	0.185	75 0.8	5 0.1	206 6.4	13 44.4	0.64420	1.30282	3.83	0.5836
	24	0.3934	0.179	0.194	74 36.2	4 58.4	205 11.7	13 40.8	0.64928	1.30331	3.71	0.5697
	25	0.3962	0.188	0.203	74 0.3	4 56.0	204 17.1	13 37.1	0.65530	1.30378	3.59	0.5552
	26	0.3989	0.200	0.213	73 11.6	4 52.8	203 22.7	13 33.5	0.66150	1.30425	3.47	0.5401
	27	0.4017	+0.215	+0.222	72 11.1	4 48.7	202 28.4	13 29.9	+0.66716	+1.30470	-3.34	-0.5243
	28	0.4044	0.231	0.232	71 2.2	4 44.1	201 34.2	13 26.3	0.67169	1.30514	3.22	0.5078
	29	0.4071	0.247	0.242	69 49.2	4 39.3	200 40.1	13 22.7	0.67477	1.30556	3.09	0.4906
	30	0.4099	0.262	0.251	68 37.0	4 34.5	199 46.2	13 19.1	0.67633	1.30597	2.97	0.4725
	31	0.4126	0.275	0.261	67 30.7	4 30.0	198 52.4	13 15.5	0.67660	1.30636	2.84	0.4535
June	1	0.4154	+0.286	+0.271	66 34.1	4 26.3	197 58.6	13 11.9	+0.67600	+1.30673	-2.71	-0.4335
	2	0.4181	0.294	0.281	65 49.8	4 23.3	197 5.0	13 8.3	0.67519	1.30709	2.58	0.4124
	3	0.4208	0.300	0.291	65 18.1	4 21.2	196 11.5	13 4.8	0.67484	1.30743	2.46	0.3901
	4	0.4236	0.305	0.301	64 56.6	4 19.8	195 18.1	13 1.2	0.67555	1.30776	2.33	0.3665
	5	0.4263	0.309	0.311	64 40.9	4 18.7	194 24.7	12 57.6	0.67779	1.30807	2.20	0.3414
	(17.0)	6	0.4290	+0.315	+0.321	64 25.8	4 17.7	193 31.5	+0.68149	+1.30837	-2.06	-0.3146
	7	0.4318	0.322	0.331	64 5.8	4 16.4	192 38.3	12 50.6	0.68651	1.30864	1.93	0.2860
	8	0.4345	0.333	0.342	63 37.2	4 14.5	191 45.2	12 47.0	0.69231	1.30890	1.80	0.2553
	9	0.4372	0.345	0.352	62 58.0	4 11.9	190 52.2	12 43.5	0.69819	1.30914	1.67	0.2219
	10	0.4400	0.359	0.362	62 8.7	4 8.6	189 59.2	12 39.9	0.70351	1.30936	1.53	0.1858
	11	0.4427	+0.374	+0.372	61 11.6	4 4.8	189 6.3	12 36.4	+0.70773	+1.30957	-1.40	-0.1462
	12	0.4455	0.389	0.383	60 10.2	4 0.7	188 13.5	12 32.9	0.71059	1.30975	1.27	0.1025
	13	0.4482	0.402	0.393	59 9.1	3 56.6	187 20.7	12 29.4	0.71203	1.30992	1.13	0.0539
	14	0.4509	0.413	0.403	58 12.9	3 52.9	186 27.9	12 25.9	0.71226	1.31007	1.00	9.9990
(18.0)	15	0.4537	0.422	0.414	57 24.9	3 49.7	185 35.3	12 22.4	0.71173	1.31020	0.86	9.9359
	16	0.4564	+0.429	+0.424	56 47.1	3 47.1	184 42.7	12 18.8	+0.71106	+1.31031	-0.73	-9.8621
	17	0.4592	0.434	0.434	56 19.6	3 45.3	183 50.1	12 15.3	0.71091	1.31041	0.59	9.7729
	18	0.4619	0.439	0.445	56 0.3	3 44.0	182 57.5	12 11.8	0.71182	1.31048	0.46	9.6604
	19	0.4646	0.444	0.455	55 45.0	3 43.0	182 4.9	12 8.3	0.71147	1.31053	0.32	9.5081
	20	0.4674	0.451	0.466	55 28.7	3 41.9	181 12.4	12 4.8	0.711804	1.31057	0.19	9.2714
	21	0.4701	+0.461	+0.476	55 7.0	3 40.5	180 19.9	12 1.3	+0.72316	+1.31059	-0.05	-8.7107
	22	0.4728	0.473	0.487	54 36.1	3 38.4	179 27.4	11 57.8	0.72905	1.31058	+0.08	+8.9246
	23	0.4756	0.488	0.497	53 54.5	3 35.6	178 34.9	11 54.3	0.73506	1.31056	0.22	9.3413
	24	0.4783	0.504	0.508	53 2.9	3 32.2	177 42.4	11 50.8	0.74063	1.31052	0.35	9.5499
	25	0.4811	0.521	0.518	52 3.8	3 28.3	176 49.9	11 47.3	0.74522	1.31046	0.49	9.6901
	26	0.4838	+0.538	+0.529	51 1.0	3 24.1	175 57.4	11 43.8	+0.74861	+1.31039	+0.62	+9.7958
	27	0.4865	0.552	0.539	49 59.0	3 19.9	175 4.9	11 40.3	0.75066	1.31029	0.76	9.8807
	28	0.4893	0.564	0.549	49 2.2	3 16.1	174 12.4	11 36.8	0.75157	1.31017	0.89	9.9516
July	29	0.4920	0.573	0.560	48 14.0	3 12.9	173 19.8	11 33.3	0.75174	1.31004	1.03	0.0124
	30	0.4948	0.580	0.570	47 36.5	3 10.4	172 27.1	11 29.8	0.75168	1.30989	1.16	0.0656
	1	0.4975	+0.586	+0.581	47 9.8	3 8.7	171 34.5	11 26.3	+0.75197	+1.30971	+1.30	+0.1129
	2	0.5002	+0.591	+0.590	46 52.1	3 7.5	170 41.8	11 22.8	+0.75309	+1.30952	+1.43	+0.1554

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
July	y	s	s	°	h m	°	h m	°	h m			"	
	1	0.4975	+0.586	+0.581	47 9.8	3 8.7	171 34.5	11 26.3	11 26.3	+0.75197	+1.30971	+1.30	+0.1129
	2	0.5002	0.591	0.591	46 52.1	3 7.5	170 41.8	11 22.8	11 22.8	0.75309	1.30952	1.43	0.1554
	3	0.5030	0.596	0.601	46 39.6	3 6.6	169 49.0	11 19.3	11 19.3	0.75535	1.30932	1.56	0.1940
	4	0.5057	0.603	0.611	46 27.6	3 5.8	168 56.2	11 15.7	11 15.7	0.75883	1.30909	1.70	0.2294
	5	0.5084	0.612	0.622	46 11.7	3 4.8	168 3.3	11 12.2	11 12.2	0.76333	1.30885	1.83	0.2620
	h												
	6	0.5112	+0.624	+0.632	45 48.2	3 3.2	167 10.4	11 8.7	11 8.7	+0.76839	+1.30859	+1.96	+0.2922
	(19.0)	7	0.5139	0.638	0.642	45 15.5	3 1.0	166 17.4	11 5.2	0.77349	1.30831	2.09	0.3204
	8	0.5166	0.652	0.652	44 33.9	2 58.3	165 24.3	11 1.6	11 1.6	0.77811	1.30801	2.22	0.3467
	9	0.5194	0.667	0.662	43 45.4	2 55.0	164 31.1	10 58.1	10 58.1	0.78180	1.30770	2.35	0.3714
	10	0.5221	0.681	0.672	42 53.3	2 51.6	163 37.8	10 54.5	10 54.5	0.78431	1.30737	2.48	0.3946
	11	0.5249	+0.692	+0.682	42 1.5	2 48.1	162 44.5	10 51.0	10 51.0	+0.78563	+1.30702	+2.61	+0.4166
	12	0.5276	0.701	0.692	41 14.1	2 44.9	161 51.1	10 47.4	10 47.4	0.78597	1.30666	2.74	0.4374
	13	0.5303	0.708	0.702	40 34.2	2 42.3	160 57.6	10 43.8	10 43.8	0.78574	1.30628	2.87	0.4571
	14	0.5331	0.713	0.712	40 3.6	2 40.2	160 4.0	10 40.3	10 40.3	0.78541	1.30589	2.99	0.4758
	15	0.5358	0.717	0.721	39 42.3	2 38.8	159 10.2	10 36.7	10 36.7	0.78551	1.30548	3.12	0.4937
	16	0.5386	+0.721	+0.731	39 28.2	2 37.9	158 16.4	10 33.1	10 33.1	+0.78653	+1.30506	+3.24	+0.5107
	17	0.5413	0.726	0.741	39 17.7	2 37.2	157 22.5	10 29.5	10 29.5	0.78875	1.30462	3.37	0.5270
	18	0.5440	0.734	0.750	39 6.5	2 36.4	156 28.5	10 25.9	10 25.9	0.79220	1.30417	3.49	0.5426
	19	0.5468	0.745	0.760	38 50.6	2 35.4	155 34.3	10 22.3	10 22.3	0.79670	1.30371	3.61	0.5575
	20	0.5495	0.758	0.769	38 26.6	2 33.8	154 40.0	10 18.7	10 18.7	0.80180	1.30323	3.73	0.5718
Aug.	h												
	(20.0)	21	0.5522	+0.773	+0.778	37 53.6	2 31.6	153 45.6	10 15.0	+0.80699	+1.30275	+3.85	+0.5856
	22	0.5550	0.789	0.788	37 12.0	2 28.8	152 51.1	10 11.4	10 11.4	0.81173	1.30224	3.97	0.5988
	23	0.5577	0.804	0.797	36 24.3	2 25.6	151 56.4	10 7.8	10 7.8	0.81562	1.30173	4.09	0.6115
	24	0.5605	0.818	0.806	35 33.6	2 22.2	151 1.6	10 4.1	10 4.1	0.81843	1.30121	4.20	0.6237
	25	0.5632	0.830	0.815	34 44.0	2 18.9	150 6.7	10 0.4	10 0.4	0.82013	1.30067	4.32	0.6355
	26	0.5659	+0.839	+0.824	33 59.5	2 16.0	149 11.6	9 56.8	9 56.8	+0.82088	+1.30013	+4.43	+0.6468
	27	0.5687	0.845	0.833	33 23.0	2 13.5	148 16.3	9 53.1	9 53.1	0.82099	1.29957	4.55	0.6577
	28	0.5714	0.849	0.842	32 55.9	2 11.7	147 20.9	9 49.4	9 49.4	0.82094	1.29901	4.66	0.6683
	29	0.5742	0.852	0.851	32 38.1	2 10.5	146 25.3	9 45.7	9 45.7	0.82120	1.29844	4.77	0.6785
	30	0.5769	0.856	0.860	32 27.8	2 9.9	145 29.6	9 42.0	9 42.0	0.82217	1.29786	4.88	0.6883
	31	0.5796	+0.861	+0.868	32 21.6	2 9.4	144 33.7	9 38.2	9 38.2	+0.82413	+1.29727	+4.99	+0.6978
	Aug.	1	0.5824	0.868	0.877	32 15.2	2 9.0	143 37.6	9 34.5	0.82705	1.29667	5.09	0.7070
	2	0.5851	0.877	0.885	32 4.7	2 8.3	142 41.3	9 30.8	9 30.8	0.83077	1.29607	5.20	0.7159
	3	0.5878	0.888	0.893	31 47.2	2 7.1	141 44.9	9 27.0	9 27.0	0.83492	1.29547	5.30	0.7245
	4	0.5906	0.901	0.902	31 21.4	2 5.4	140 48.3	9 23.2	9 23.2	0.83904	1.29486	5.40	0.7328
(21.0)	h												
	5	0.5933	+0.914	+0.910	30 47.8	2 3.2	139 51.5	9 19.4	9 19.4	+0.84268	+1.29424	+5.51	+0.7408
	6	0.5960	0.926	0.918	30 8.6	2 0.6	138 54.5	9 15.6	9 15.6	0.84550	1.29362	5.61	0.7486
	7	0.5988	0.936	0.926	29 26.8	1 57.8	137 57.4	9 11.8	9 11.8	0.84730	1.29300	5.70	0.7561
	8	0.6015	0.944	0.934	28 46.3	1 55.1	137 0.1	9 8.0	9 8.0	0.84810	1.29237	5.80	0.7634
	9	0.6043	0.950	0.942	28 10.4	1 52.7	136 2.6	9 4.2	9 4.2	0.84810	1.29174	5.90	0.7704
	10	0.6070	+0.953	+0.950	27 41.8	1 50.8	135 4.9	9 0.3	9 0.3	+0.84765	+1.29112	+5.99	+0.7773
	11	0.6097	0.955	0.957	27 21.7	1 49.4	134 7.0	8 56.5	8 56.5	0.84721	1.29049	6.08	0.7838
	12	0.6125	0.957	0.965	27 9.9	1 48.7	133 8.9	8 52.6	8 52.6	0.84726	1.28986	6.17	0.7902
	13	0.6152	0.959	0.972	27 4.1	1 48.3	132 10.7	8 48.7	8 48.7	0.84817	1.28924	6.26	0.7964
	14	0.6180	0.964	0.980	27 1.0	1 48.1	131 12.2	8 44.8	8 44.8	0.85015	1.28861	6.34	0.8023
	15	0.6207	+0.972	+0.987	26 56.6	1 47.8	130 13.6	8 40.9	8 40.9	+0.85317	+1.28799	+6.43	+0.8081
	16	0.6234	+0.982	+0.995	26 47.3	1 47.2	129 14.8	8 37.0	8 37.0	+0.85703	+1.28737	+6.51	+0.8136

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .	
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.							
	y	s	s	s	h m	s	h m	s	h m					
Aug. 16	0.6234	+0.982	+0.995	26 47.3	1 47.2	129 14.8	8 37.0	+0.85703	+1.28737	+6.51	+0.8136			
17	0.6262	0.994	1.002	26 30.8	1 46.1	128 15.8	8 33.1	0.86133	1.28676	6.59	0.8190			
18	0.6289	1.007	1.009	26 6.2	1 44.4	127 16.6	8 29.1	0.86562	1.28615	6.67	0.8242			
19	0.6316	1.021	1.016	25 34.3	1 42.3	126 17.3	8 25.2	0.86942	1.28554	6.75	0.8292			
h (22.0)	20	0.6344	1.033	1.023	24 57.6	1 39.8	125 17.7	8 21.2	0.87246	1.28494	6.82	0.8340		
21	0.6371	+1.043	+1.030	24 19.3	1 37.3	124 18.0	8 17.2	+0.87451	+1.28436	+6.90	+0.8387			
22	0.6399	1.051	1.037	23 43.0	1 34.9	123 18.1	8 13.2	0.87560	1.28377	6.97	0.8431			
23	0.6426	1.056	1.043	23 12.0	1 32.8	122 18.0	8 9.2	0.87589	1.28320	7.04	0.8475			
24	0.6453	1.059	1.050	22 48.7	1 31.2	121 17.7	8 5.2	0.87573	1.28263	7.11	0.8516			
25	0.6481	1.060	1.057	22 34.2	1 30.3	120 17.2	8 1.2	0.87549	1.28208	7.17	0.8556			
26	0.6508	+1.061	+1.063	22 27.8	1 29.9	119 16.6	7 57.1	+0.87563	+1.28154	+7.24	+0.8595			
27	0.6536	1.063	1.069	22 27.1	1 29.8	118 15.8	7 53.1	0.87649	1.28100	7.30	0.8631			
28	0.6563	1.067	1.076	22 28.9	1 29.9	117 14.8	7 49.0	0.87822	1.28048	7.36	0.8667			
29	0.6590	1.073	1.082	22 29.3	1 30.0	116 13.6	7 44.9	0.88081	1.27997	7.41	0.8701			
30	0.6618	1.082	1.088	22 25.0	1 29.7	115 12.2	7 40.8	0.88402	1.27948	7.47	0.8733			
Sept. 31	0.6645	+1.092	+1.094	22 13.8	1 28.9	114 10.7	7 36.7	+0.88750	+1.27900	+7.52	+0.8764			
1	0.6672	1.103	1.101	21 55.2	1 27.7	113 9.0	7 32.6	0.89085	1.27853	7.57	0.8793			
2	0.6700	1.113	1.107	21 29.9	1 26.0	112 7.2	7 28.5	0.89368	1.27808	7.62	0.8821			
3	0.6727	1.122	1.113	21 0.6	1 24.0	111 5.1	7 24.3	0.89569	1.27765	7.67	0.8848			
h (23.0)	4	0.6754	1.129	1.119	20 30.2	1 22.0	110 2.9	7 20.2	0.89679	1.27723	7.72	0.8873		
5	0.6782	+1.133	+1.124	20 2.1	1 20.1	109 0.6	7 16.0	+0.89709	+1.27683	+7.76	+0.8897			
6	0.6809	1.135	1.130	19 39.2	1 18.6	107 58.1	7 11.9	0.89677	1.27645	7.80	0.8920			
7	0.6837	1.135	1.136	19 23.9	1 17.6	106 55.5	7 7.7	0.89620	1.27609	7.84	0.8941			
8	0.6864	1.135	1.142	19 16.5	1 17.1	105 52.7	7 3.5	0.89579	1.27574	7.87	0.8961			
9	0.6891	1.136	1.148	19 16.2	1 17.1	104 49.8	6 59.3	0.89597	1.27541	7.91	0.8980			
10	0.6919	+1.138	+1.153	19 20.2	1 17.3	103 46.8	6 55.1	+0.89702	+1.27511	+7.94	+0.8997			
11	0.6946	1.143	1.159	19 25.4	1 17.7	102 43.7	6 50.9	0.89907	1.27483	7.97	0.9013			
12	0.6974	1.150	1.164	19 28.2	1 17.9	101 40.5	6 46.7	0.90202	1.27456	7.99	0.9028			
13	0.7001	1.160	1.170	19 25.6	1 17.7	100 37.2	6 42.5	0.90561	1.27432	8.02	0.9041			
14	0.7028	1.172	1.176	19 15.9	1 17.1	99 33.8	6 38.3	0.90947	1.27410	8.04	0.9053			
15	0.7056	+1.184	+1.181	18 58.8	1 15.9	98 30.3	6 34.0	+0.91319	+1.27390	+8.06	+0.9064			
16	0.7083	1.195	1.187	18 35.9	1 14.4	97 26.7	6 29.8	0.91637	1.27373	8.08	0.9073			
17	0.7110	1.205	1.192	18 9.8	1 12.7	96 23.1	6 25.5	0.91873	1.27358	8.09	0.9081			
18	0.7138	1.212	1.198	17 43.6	1 10.9	95 19.3	6 21.3	0.92019	1.27345	8.11	0.9088			
19	0.7165	1.216	1.203	17 20.7	1 9.4	94 15.4	6 17.0	0.92085	1.27334	8.12	0.9094			
h (0.0)	20	0.7193	+1.218	+1.209	17 3.8	1 8.3	93 11.6	+0.92094	+1.27326	+8.13	+0.9099			
21	0.7220	1.219	1.214	16 54.4	1 7.6	92 7.7	6 8.5	0.92077	1.27320	8.13	0.9102			
22	0.7247	1.219	1.219	16 53.0	1 7.5	91 3.7	6 4.2	0.92072	1.27316	8.14	0.9104			
23	0.7275	1.220	1.225	16 58.0	1 7.9	89 59.7	6 0.0	0.92118	1.27315	8.14	0.9104			
24	0.7302	1.222	1.230	17 6.8	1 8.4	88 55.6	5 55.7	0.92240	1.27316	8.14	0.9104			
25	0.7330	+1.227	+1.235	17 16.1	1 9.1	87 51.5	5 51.4	+0.92445	+1.27320	+8.13	+0.9102			
26	0.7357	1.234	1.241	17 22.4	1 9.5	86 47.4	5 47.2	0.92720	1.27326	8.13	0.9099			
27	0.7384	1.243	1.246	17 23.3	1 9.6	85 43.3	5 42.9	0.93037	1.27334	8.12	0.9094			
28	0.7412	1.253	1.252	17 17.3	1 9.2	84 39.1	5 38.6	0.93365	1.27345	8.11	0.9088			
29	0.7439	1.263	1.257	17 4.5	1 8.3	83 35.0	5 34.3	0.93665	1.27358	8.09	0.9081			
30	0.7466	+1.272	+1.263	16 46.8	1 7.1	82 30.8	5 30.1	+0.93906	+1.27374	+8.08	+0.9073			
Oct. 1	0.7494	+1.279	+1.268	16 26.6	1 5.8	81 26.7	5 25.8	+0.94071	+1.27391	+8.06	+0.9063			

# INDEPENDENT STAR-NUMBERS, 1907.

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(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$	$f'$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .	
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.					
	$y$	$s$	$s$	$^{\circ}$	$h$ $m$	$^{\circ}$	$h$ $m$			$''$		
Oct.	1	0.7494	+1.279	+1.268	16 26.6	1 5.8	81 26.7	5 25.8	+0.94071	+1.27391	+8.06	+0.9063
	2	0.7521	1.284	1.274	16 7.0	1 4.5	80 22.5	5 21.5	0.94156	1.27411	8.04	0.9052
	3	0.7548	1.286	1.280	15 51.2	1 3.4	79 18.4	5 17.2	0.94174	1.27434	8.02	0.9040
	4	0.7576	1.287	1.285	15 41.3	1 2.8	78 14.3	5 12.9	0.94155	1.27458	7.99	0.9026
	5	0.7603	1.286	1.291	15 38.7	1 2.6	77 10.3	5 8.7	0.94135	1.27485	7.96	0.9011
	6	0.7631	+1.286	+1.297	15 42.9	1 2.9	76 6.3	5 4.4	+0.94152	+1.27514	+7.93	+0.8995
	7	0.7658	1.288	1.302	15 52.3	1 3.5	75 2.4	5 0.2	0.94238	1.27545	7.90	0.8977
	8	0.7685	1.292	1.308	16 4.1	1 4.3	73 58.5	4 55.9	0.94413	1.27579	7.87	0.8958
	9	0.7713	1.299	1.314	16 15.0	1 5.0	72 54.6	4 51.6	0.94683	1.27614	7.83	0.8938
	10	0.7740	1.308	1.320	16 21.8	1 5.5	71 50.9	4 47.4	0.95022	1.27651	7.79	0.8916
	11	0.7768	+1.320	+1.326	16 22.4	1 5.5	70 47.2	4 43.1	+0.95405	+1.27691	+7.75	+0.8893
	12	0.7795	1.332	1.332	16 16.3	1 5.1	69 43.6	4 38.9	0.95790	1.27732	7.71	0.8868
	13	0.7822	1.344	1.340	16 4.1	1 4.3	68 40.1	4 34.7	0.96142	1.27775	7.66	0.8842
	14	0.7850	1.355	1.344	15 47.7	1 3.2	67 36.7	4 30.4	0.96433	1.27820	7.61	0.8814
	15	0.7877	1.364	1.350	15 29.8	1 2.0	66 33.4	4 26.2	0.96643	1.27866	7.56	0.8785
	16	0.7904	+1.370	+1.356	15 13.5	1 0.9	65 30.3	4 22.0	+0.96782	+1.27914	+7.51	+0.8754
	17	0.7932	1.374	1.363	15 1.7	1 0.1	64 27.2	4 17.8	0.96858	1.27964	7.45	0.8722
	18	0.7959	1.376	1.369	14 56.1	0 59.7	63 24.2	4 13.6	0.96898	1.28016	7.39	0.8688
	19	0.7987	1.377	1.375	14 57.5	0 59.8	62 21.4	4 9.4	0.96940	1.28068	7.33	0.8653
	20	0.8014	1.378	1.382	15 5.2	1 0.3	61 18.7	4 5.2	0.97015	1.28122	7.27	0.8616
	21	0.8041	+1.381	+1.388	15 17.2	1 1.1	60 16.1	4 1.1	+0.97151	+1.28178	+7.21	+0.8577
	22	0.8069	1.387	1.395	15 30.6	1 2.0	59 13.6	3 56.9	0.97363	1.28234	7.14	0.8537
	23	0.8096	1.394	1.402	15 42.3	1 2.8	58 11.3	3 52.8	0.97643	1.28292	7.07	0.8495
	24	0.8124	1.404	1.409	15 49.5	1 3.3	57 9.1	3 48.6	0.97976	1.28351	7.00	0.8451
	25	0.8151	1.416	1.416	15 50.7	1 3.3	56 7.0	3 44.5	0.98331	1.28411	6.93	0.8405
	26	0.8178	+1.428	+1.423	15 45.5	1 3.0	55 5.0	3 40.3	+0.98674	+1.28472	+6.85	+0.8358
	27	0.8206	1.439	1.430	15 34.9	1 2.3	54 3.2	3 36.2	0.98974	1.28534	6.77	0.8309
	28	0.8233	1.448	1.437	15 21.1	1 1.4	53 1.6	3 32.1	0.99209	1.28596	6.69	0.8257
	29	0.8260	1.455	1.444	15 6.6	1 0.4	52 0.0	3 28.0	0.99372	1.28659	6.61	0.8204
	30	0.8288	1.460	1.452	14 54.5	0 59.6	50 58.6	3 23.9	0.99471	1.28723	6.53	0.8149
31	0.8315	+1.463	+1.459	14 46.9	0 59.1	49 57.4	3 19.8	+0.99529	+1.28787	+6.44	+0.8091	
Nov.	1	0.8342	1.464	1.467	14 45.2	0 59.0	48 56.3	3 15.8	0.99573	1.28852	6.36	0.8032
	2	0.8370	1.466	1.475	14 49.6	0 59.3	47 55.4	3 11.7	0.99639	1.28917	6.27	0.7970
	3	0.8397	1.469	1.482	14 59.1	0 59.9	46 54.5	3 7.6	0.99758	1.28982	6.17	0.7906
	4	0.8425	1.474	1.490	15 11.4	1 0.8	45 53.9	3 3.6	0.99953	1.29048	6.08	0.7839
	5	0.8452	+1.482	+1.498	15 23.7	1 1.6	44 53.4	2 59.6	+1.00229	+1.29113	+5.98	+0.7771
	6	0.8479	1.493	1.506	15 33.1	1 2.2	43 53.1	2 55.5	1.00576	1.29179	5.89	0.7699
	7	0.8507	1.506	1.514	15 37.5	1 2.5	42 52.9	2 51.5	1.00972	1.29245	5.79	0.7625
	8	0.8534	1.521	1.523	15 35.6	1 2.4	41 52.8	2 47.5	1.01382	1.29310	5.69	0.7549
	9	0.8562	1.536	1.531	15 27.9	1 1.9	40 52.9	2 43.5	1.01775	1.29375	5.58	0.7469
	10	0.8589	+1.549	+1.539	15 15.5	1 1.0	39 53.2	2 39.6	+1.02120	+1.29440	+5.48	+0.7387
	11	0.8616	1.561	1.548	15 0.8	1 0.1	38 53.7	2 35.6	1.02401	1.29505	5.37	0.7302
	12	0.8644	1.571	1.557	14 46.5	0 59.1	37 54.2	2 31.6	1.02613	1.29569	5.26	0.7214
	13	0.8671	1.577	1.565	14 35.1	0 58.3	36 55.0	2 27.7	1.02763	1.29633	5.15	0.7122
	14	0.8698	1.582	1.574	14 28.6	0 57.9	35 55.9	2 23.7	1.02875	1.29696	5.04	0.7027
	15	0.8726	+1.586	+1.583	14 27.8	0 57.9	34 56.9	2 19.8	+1.02977	+1.29758	+4.93	+0.6929
	16	0.8753	+1.590	+1.592	14 32.7	0 58.2	33 58.1	2 15.9	+1.03098	+1.29819	+4.82	+0.6827

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	$y$	$s$	$s$	$s$	$h$	$m$	$h$	$m$	$h$			$''$	
Nov. 16	0.8753	+1.590	+1.592	14 32.7	0 58.2	33 58.1	2 15.9	+1.03098	+1.29819	+4.82	+0.6827		
17	0.8781	1.595	1.601	14 41.7	0 58.8	32 59.4	2 12.0	1.03265	1.29880	4.70	0.6721		
18	0.8808	1.602	1.610	14 52.6	0 59.5	32 0.9	2 8.1	1.03494	1.29940	4.58	0.6611		
19	0.8835	1.612	1.620	15 2.8	1 0.2	31 2.5	2 4.2	1.03786	1.29999	4.46	0.6496		
h 20	0.8863	1.624	1.629	15 9.6	1 0.6	30 4.2	2 0.3	1.04128	1.30057	4.34	0.6377		
(4.0) 21	0.8890	+1.637	+1.639	15 11.5	1 0.8	29 6.0	1 56.4	+1.04497	+1.30113	+4.22	+0.6254		
22	0.8918	1.652	1.648	15 7.5	1 0.5	28 8.0	1 52.5	1.04863	1.30169	4.10	0.6125		
23	0.8945	1.666	1.658	14 58.4	0 59.9	27 10.1	1 48.7	1.05199	1.30223	3.97	0.5991		
24	0.8972	1.678	1.668	14 45.6	0 59.0	26 12.4	1 44.8	1.05485	1.30276	3.85	0.5851		
25	0.9000	1.689	1.678	14 31.3	0 58.1	25 14.7	1 41.0	1.05707	1.30328	3.72	0.5705		
26	0.9027	+1.697	+1.687	14 18.0	0 57.2	24 17.1	1 37.1	+1.05869	+1.30379	+3.59	+0.5552		
27	0.9054	1.703	1.697	14 7.8	0 56.5	23 19.7	1 33.3	1.05985	1.30428	3.46	0.5392		
28	0.9082	1.707	1.707	14 2.3	0 56.2	22 22.4	1 29.5	1.06081	1.30475	3.33	0.5225		
29	0.9109	1.711	1.718	14 2.1	0 56.1	21 25.1	1 25.7	1.06184	1.30521	3.20	0.5050		
30	0.9136	1.716	1.728	14 6.4	0 56.4	20 28.0	1 21.9	1.06322	1.30565	3.07	0.4866		
Dec. 1	0.9164	+1.723	+1.738	14 13.8	0 56.9	19 30.9	1 18.1	+1.06517	+1.30608	+2.93	+0.4672		
2	0.9191	1.732	1.749	14 21.9	0 57.5	18 33.9	1 14.3	1.06781	1.30649	2.80	0.4467		
3	0.9219	1.744	1.759	14 28.3	0 57.9	17 37.1	1 10.5	1.07106	1.30688	2.66	0.4251		
h 4	0.9246	1.759	1.770	14 30.8	0 58.1	16 40.3	1 6.7	1.07481	1.30725	2.53	0.4022		
(5.0) 5	0.9273	1.776	1.780	14 28.2	0 57.9	15 43.5	1 2.9	1.07878	1.30761	2.39	0.3779		
6	0.9301	+1.793	+1.791	14 20.1	0 57.3	14 46.9	0 59.1	+1.08267	+1.30795	+2.25	+0.3520		
7	0.9328	1.809	1.801	14 7.5	0 56.5	13 50.3	0 55.4	1.08624	1.30826	2.11	0.3243		
8	0.9356	1.824	1.812	13 52.1	0 55.5	12 53.8	0 51.6	1.08926	1.30856	1.97	0.2945		
9	0.9383	1.837	1.823	13 36.1	0 54.4	11 57.4	0 47.8	1.09169	1.30884	1.83	0.2624		
10	0.9410	1.846	1.834	13 21.7	0 53.4	11 1.0	0 44.1	1.09355	1.30910	1.69	0.2276		
11	0.9438	+1.854	+1.845	13 10.8	0 52.7	10 4.7	0 40.3	+1.09500	+1.30934	+1.55	+0.1896		
12	0.9465	1.860	1.855	13 4.6	0 52.3	9 8.4	0 36.6	1.09624	1.30956	1.41	0.1478		
13	0.9492	1.866	1.866	13 3.3	0 52.2	8 12.2	0 32.8	1.09752	1.30976	1.26	0.1014		
14	0.9520	1.872	1.877	13 6.2	0 52.4	7 16.0	0 29.1	1.09910	1.30994	1.12	0.0493		
15	0.9547	1.880	1.888	13 11.3	0 52.7	6 19.9	0 25.3	1.10115	1.31009	0.98	0.9898		
16	0.9575	+1.891	+1.899	13 16.8	0 53.1	5 23.8	0 21.6	+1.10373	+1.31023	+0.83	+0.9208		
17	0.9602	1.904	1.910	13 19.9	0 53.4	4 27.7	0 17.8	1.10678	1.31034	0.69	0.8385		
18	0.9629	1.919	1.921	13 19.3	0 53.3	3 31.6	0 14.1	1.11012	1.31043	0.55	0.7366		
19	0.9657	1.934	1.932	13 13.9	0 52.9	2 35.5	0 10.4	1.11352	1.31051	0.40	0.6032		
h 20	0.9684	1.950	1.943	13 3.8	0 52.1	1 39.5	0 6.6	1.11672	1.31056	0.26	0.4092		
(6.0) 21	0.9712	+1.965	+1.955	12 49.6	0 51.3	0 43.4	0 2.9	+1.11955	+1.31058	+0.11	+0.0492		
22	0.9739	1.977	1.966	12 33.5	0 50.2	359 47.4	23 59.2	1.12184	1.31059	-0.03	-0.85133		
23	0.9766	1.987	1.977	12 17.5	0 49.2	358 51.3	23 55.4	1.12359	1.31057	0.18	0.2485		
24	0.9794	1.995	1.988	12 3.4	0 48.2	357 55.2	23 51.7	1.12486	1.31053	0.32	0.5076		
25	0.9821	2.001	1.999	11 52.9	0 47.4	356 59.1	23 47.9	1.12583	1.31048	0.47	0.6687		
26	0.9848	+2.006	+2.010	11 46.9	0 47.1	356 3.0	23 44.2	+1.12673	+1.31039	-0.61	-0.7858		
27	0.9876	2.011	2.021	11 45.2	0 47.0	355 6.8	23 40.5	1.12783	1.31029	0.76	0.9779		
28	0.9903	2.018	2.032	11 46.7	0 47.1	354 10.6	23 36.7	1.12934	1.31017	0.90	0.9537		
29	0.9930	2.027	2.043	11 49.8	0 47.3	353 14.4	23 33.0	1.13140	1.31002	1.04	0.0181		
30	0.9958	2.039	2.054	11 52.3	0 47.5	352 18.1	23 29.2	1.13401	1.30986	1.19	0.0741		
31	0.9985	+2.054	+2.065	11 52.2	0 47.5	351 21.7	23 25.4	+1.13709	+1.30967	-1.33	-0.1236		
32	1.0013	+2.070	+2.076	11 48.1	0 47.2	350 25.3	23 21.7	+1.14043	+1.30946	-1.47	-0.1678		



# BESSELIAN AND INDEPENDENT STAR-NUMBERS, 1907. 303

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A'.	Log B'.	Log C.	Log D.	f'	G'	H	Log g'.	Log h.	Log i.
Jan. 0.72	-9.4472	+0.7499	-0.5078	+1.3041	-0.863	134 58	350 55	+0.9002	+1.3096	-0.1451
10.70	9.3914	0.7366	0.8082	1.2834	0.759	132 10	341 29	0.8667	1.3065	0.4455
20.67	9.3313	0.7185	0.9748	1.2472	0.661	129 26	331 54	0.8306	1.3017	0.6121
30.64	9.2681	0.6966	1.0843	1.1926	0.572	126 47	322 5	0.7930	1.2957	0.7216
Feb. 9.61	9.2026	0.6725	1.1602	1.1146	0.492	124 12	312 0	0.7550	1.2891	0.7976
19.59	-9.1353	+0.6482	-1.2129	+1.0026	-0.422	121 37	301 38	+0.7180	+1.2828	-0.8502
Mar. 1.56	9.0657	0.6261	1.2476	0.8330	0.360	118 53	291 3	0.6838	1.2776	0.8849
11.53	8.9913	0.6085	1.2672	+0.5270	0.304	115 50	280 19	0.6542	1.2742	0.9045
21.50	8.9069	0.5970	1.2731	-9.2059	0.251	112 16	269 31	0.6306	1.2731	0.9104
31.48	8.8020	0.5923	1.2661	0.5638	0.197	108 0	258 47	0.6141	1.2744	0.9034
Apr. 10.45	-8.6533	+0.5943	-1.2458	-0.8473	-0.141	102 56	248 13	+0.6054	+1.2779	-0.8831
20.42	8.3943	0.6015	1.2112	1.0080	0.079	97 6	237 56	0.6048	1.2830	0.8485
30.39	-7.3202	0.6118	1.1600	1.1149	-0.009	90 35	227 58	0.6118	1.2891	0.7974
May 10.37	+8.3681	0.6230	1.0879	1.1900	+0.069	83 38	218 20	0.6256	1.2954	0.7253
20.34	8.7121	0.6329	0.9868	1.2430	0.156	76 28	209 0	0.6451	1.3012	0.6242
30.31	+8.9147	+0.6397	-0.8385	-1.2791	+0.250	69 18	199 56	+0.6686	+1.3059	-0.4759
June 9.29	9.0595	0.6419	0.5918	1.3010	0.350	62 20	191 3	0.6947	1.3091	0.2291
19.26	9.1711	0.6387	-9.9128	1.3102	0.453	55 40	182 18	0.7219	1.3105	-9.5501
29.23	9.2604	0.6294	+0.3598	1.3073	0.557	49 23	173 34	0.7490	1.3101	+9.9971
July 9.20	9.3331	0.6137	0.7270	1.2922	0.659	43 35	164 47	0.7753	1.3078	0.3643
19.18	+9.3929	+0.5919	+0.9155	-1.2641	+0.757	38 16	155 52	+0.8000	+1.3039	+0.5528
29.15	9.4420	0.5645	1.0377	1.2210	0.848	33 28	146 45	0.8229	1.2986	0.6750
Aug. 8.12	9.4826	0.5328	1.1234	1.1593	0.931	29 14	137 22	0.8439	1.2926	0.7607
18.09	9.5162	0.4984	1.1848	1.0726	1.006	25 35	127 41	0.8631	1.2864	0.8221
28.07	9.5441	0.4640	1.2279	0.9478	1.073	22 31	117 41	0.8807	1.2807	0.8652
Sept. 7.04	+9.5679	+0.4328	+1.2559	-0.7521	+1.133	20 4	107 24	+0.8972	+1.2762	+0.8932
17.01	9.5888	0.4081	1.2705	-0.3534	1.189	18 13	96 54	0.9133	1.2736	0.9078
26.99	9.6082	0.3927	1.2724	+0.0868	1.243	16 54	86 16	0.9295	1.2733	0.9097
Oct. 6.96	9.6271	0.3881	1.2614	0.6704	1.299	16 3	75 37	0.9465	1.2753	0.8987
16.93	9.6467	0.3937	1.2368	0.9045	1.359	15 34	65 3	0.9650	1.2793	0.8741
26.90	+9.6674	+0.4071	+1.1965	+1.0472	+1.426	15 19	54 40	+0.9853	+1.2849	+0.8338
Nov. 5.88	9.6898	0.4245	1.1371	1.1446	1.501	15 9	44 30	1.0073	1.2914	0.7745
15.85	9.7137	0.4420	1.0520	1.2133	1.587	14 56	34 36	1.0308	1.2978	0.6893
25.82	9.7388	0.4560	0.9282	1.2610	1.682	14 35	24 56	1.0551	1.3034	0.5655
Dec. 5.79	9.7644	0.4637	0.7330	1.2917	1.784	14 1	15 26	1.0797	1.3077	0.3703
15.77	+9.7899	+0.4628	+0.3348	+1.3077	+1.891	13 13	6 4	+1.1037	+1.3101	+9.9721
25.74	9.8145	0.4518	-0.0636	1.3098	2.002	12 13	356 45	1.1266	1.3104	-9.7009
35.71	+9.8376	+0.4296	-0.6477	+1.2981	+2.111	11 2	347 23	+1.1478	+1.3086	-0.2849

E = -0.002

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the fixed stars, given on pages 324-399, from the mean places, given on pages 304-311. In order to render exact interpolation possible through intervals of ten days, all short-period terms have been omitted.

MEAN PLACES FOR 1907.0. (January 0 <sup>d</sup> .795, Washington.)							
Name of Star.	Magni- tude.	Right Ascension.			Annual Variation	Declination.	Annual Variation.
		h	m	s	"	° ' "	"
33 Piscium . . . . .	4.7	0	0	34.540	+ 3.0715	- 6 13 40.13	+ 20.137
α Andromedæ . . . . .	2.1	0	3	34.687	3.0945	+ 28 34 37.18	19.881
β Cassiopeiæ . . . . .	2.4	0	4	12.593	3.1807	+ 58 38 12.66	19.863
22 Andromedæ . . . . .	4.9	0	5	29.031	3.1071	+ 45 33 17.10	20.036
γ Pegasi ( <i>Algenib</i> ) . . . . .	2.8	0	8	26.732	3.0856	+ 14 39 59.63	20.023
σ Andromedæ . . . . .	4.4	0	13	27.982	+ 3.1256	+ 36 16 10.70	+ 19.965
ι Ceti . . . . .	3.6	0	14	41.389	3.0571	- 9 20 21.91	19.976
44 Piscium . . . . .	5.8	0	20	38.094	3.0741	+ 1 25 28.80	19.942
β Hydri . . . . .	2.8	0	20	52.580	3.2117	- 77 46 40.88	20.281
12 Ceti . . . . .	6.0	0	25	17.574	3.0621	- 4 28 15.86	19.924
π Andromedæ . . . . .	4.4	0	31	54.650	+ 3.1958	+ 33 12 26.97	+ 19.853
α Cassiopeiæ ( <i>var.</i> ) . . . . .	2.3	0	35	13.420	3.3824	+ 56 1 38.67	19.778
β Ceti . . . . .	2.2	0	38	55.317	3.0129	- 18 29 48.80	19.799
21 Cassiopeiæ . . . . .	5.7	0	39	29.500	3.8926	+ 74 28 47.47	19.723
σ Cassiopeiæ . . . . .	4.7	0	39	32.315	3.3281	+ 47 46 31.91	19.742
δ Piscium . . . . .	4.8	0	43	51.372	+ 3.1095	+ 7 4 44.67	+ 19.636
γ Cassiopeiæ . . . . .	2.3	0	51	5.273	3.5922	+ 60 12 47.85	19.545
μ Andromedæ . . . . .	4.0	0	51	35.258	3.3186	+ 37 59 42.15	19.571
43 Cephei (H.) . . . . .	4.6	0	55	53.573	7.4958	+ 85 45 30.95	19.449
ε Piscium . . . . .	4.3	0	58	6.921	3.1105	+ 7 23 22.49	19.431
β Andromedæ . . . . .	2.2	1	4	31.263	+ 3.3485	+ 35 7 39.52	+ 19.140
κ Tucanæ . . . . .	4.9	1	12	36.908	2.0410	- 69 22 12.59	19.138
f Piscium . . . . .	5.1	1	13	0.064	3.0920	+ 3 7 29.60	19.012
θ Ceti . . . . .	3.6	1	19	22.467	2.9976	- 8 39 47.02	18.641
38 Cassiopeiæ . . . . .	5.9	1	24	17.703	4.4038	+ 69 47 10.72	18.634
α Ursæ Minoris ( <i>Polaris</i> ) . . . . .	2.2	1	25	34.81*	+ 26.6914	+ 88 48 37.63	+ 18.668
η Piscium . . . . .	3.7	1	26	30.281	3.2047	+ 14 51 59.83	18.632
υ Andromedæ . . . . .	4.2	1	31	20.058	3.5071	+ 40 56 25.99	18.099
π Piscium . . . . .	5.5	1	32	9.989	3.1755	+ 11 39 57.62	18.481
α Eridani ( <i>Achernar</i> ) . . . . .	0.4	1	34	15.085	2.2374	- 57 42 32.94	18.334
ν Piscium . . . . .	4.6	1	36	35.423	+ 3.1190	+ 5 1 2.09	+ 18.295
σ Piscium . . . . .	4.4	1	40	28.870	3.1641	+ 8 41 23.60	18.195
ζ Ceti . . . . .	3.6	1	46	52.184	2.9599	- 10 47 39.12	17.879
β Arietis . . . . .	2.8	1	49	29.979	3.3069	+ 20 21 13.25	17.691
50 Cassiopeiæ . . . . .	4.1	1	55	28.474	5.0457	+ 71 58 17.93	17.575
γ Andromedæ . . . . .	2.2	1	58	11.163	+ 3.6681	+ 41 53 1.71	+ 17.389
α Arietis . . . . .	2.1	2	1	55.674	3.3744	+ 23 1 22.81	17.132
β Trianguli . . . . .	3.1	2	4	0.360	3.5590	+ 34 32 51.74	17.138
ξ Ceti . . . . .	4.5	2	8	14.144	3.1760	+ 8 24 38.41	16.981
γ Trianguli . . . . .	4.3	2	11	46.915	3.5560	+ 33 25 2.66	16.771
67 Ceti . . . . .	5.6	2	12	20.628	+ 2.9902	- 6 51 1.76	+ 16.685
δ Hydri . . . . .	4.2	2	20	5.442	1.0560	- 69 4 56.79	16.436
ι Cassiopeiæ . . . . .	4.6	2	21	23.520	4.8923	+ 66 59 5.10	16.361
ξ Ceti . . . . .	4.5	2	23	12.757	+ 3.1855	+ 8 2 36.82	16.251
μ Hydri . . . . .	5.3	2	33	37.304	- 1.3708	- 79 30 54.88	15.671
δ Ceti . . . . .	4.1	2	34	42.878	+ 3.0725	- 0 4 20.14	+ 15.654
θ Persei . . . . .	4.2	2	37	50.543	4.0792	+ 48 50 8.05	15.390
γ Ceti . . . . .	3.6	2	38	28.820	+ 3.1052	+ 2 50 39.20	+ 15.291

MEAN PLACES FOR 1907.0. (January 0<sup>d</sup>.795, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
$\sigma$ Arietis . . . . .	5.5	2	46	21.352	+ 3.3068	+ 14	41	56.88	+ 14.959
47 Cephei (H.) . . . . .	5.7	2	53	41.266	7.8112	+ 79	3	7.22	14.570
$\epsilon$ Arietis . . . . .	4.6	2	53	53.487	3.4239	+ 20	58	7.46	14.538
$\alpha$ Ceti . . . . .	2.6	2	57	24.994	3.1324	+ 3	43	30.91	14.256
$\beta$ Persei ( <i>Algol</i> ) ( <i>var.</i> )	2.3	3	2	6.800	3.8906	+ 40	35	52.21	14.042
48 Cephei (H.) . . . . .	5.5	3	8	29.463	+ 7.4720	+ 77	23	37.97	+ 13.585
$\zeta$ Arietis . . . . .	4.8	3	9	33.199	3.4422	+ 20	42	0.55	13.490
$\alpha$ Persei . . . . .	1.9	3	17	40.659	+ 4.2652	+ 49	31	50.56	13.012
$\iota$ Hydri . . . . .	5.7	3	18	15.628	- 1.5688	- 77	43	42.18	13.042
$f$ Tauri . . . . .	4.3	3	25	44.218	+ 3.3080	+ 12	37	6.31	12.499
$\epsilon$ Eridani . . . . .	3.7	3	28	32.891	+ 2.8248	- 9	46	21.34	+ 12.330
$\delta$ Persei . . . . .	3.1	3	36	17.917	4.2566	+ 47	29	26.67	11.725
$\gamma$ Camelopardalis . . . . .	4.6	3	40	31.669	6.2713	+ 71	2	46.88	11.404
$\eta$ Tauri . . . . .	3.1	3	41	57.232	3.5602	+ 23	49	4.85	11.308
$\zeta$ Persei . . . . .	3.0	3	48	16.987	+ 3.7638	+ 31	36	28.63	10.883
$\gamma$ Hydri . . . . .	3.3	3	48	40.198	- 0.9738	- 74	31	26.86	+ 10.986
$\epsilon$ Persei . . . . .	3.0	3	51	36.602	+ 4.0169	+ 39	44	30.23	10.625
$\gamma$ Eridani . . . . .	3.0	3	53	41.406	2.7981	- 13	46	21.62	10.387
$\Delta$ Tauri . . . . .	4.6	3	59	11.711	3.5420	+ 21	49	41.92	10.026
$c$ Persei . . . . .	4.3	4	1	54.384	4.3442	+ 47	27	53.20	9.847
$\sigma$ Eridani . . . . .	4.2	4	7	19.517	+ 2.9268	- 7	4	46.55	+ 9.549
$\gamma$ Tauri . . . . .	3.8	4	14	29.965	3.4107	+ 15	24	12.75	8.879
$\epsilon$ Tauri . . . . .	3.6	4	23	11.082	+ 3.4998	+ 18	58	28.82	8.184
$\delta$ Mensæ . . . . .	5.6	4	24	14.541	- 4.1699	- 80	25	56.14	8.206
$m$ Persei . . . . .	6.0	4	26	52.113	+ 4.2130	+ 42	51	57.00	7.928
$\alpha$ Tauri ( <i>Aldebaran</i> )	1.0	4	30	34.962	+ 3.4392	+ 16	19	22.19	+ 7.435
$\tau$ Tauri . . . . .	4.5	4	36	39.710	3.5977	+ 22	46	44.48	7.110
$\alpha$ Camelopardalis . . . . .	4.4	4	44	47.976	5.9428	+ 66	11	8.03	6.465
$i$ Tauri . . . . .	5.2	4	45	55.937	3.5068	+ 18	40	55.54	6.332
$\iota$ Aurigæ . . . . .	2.8	4	50	56.122	3.9027	+ 33	1	9.88	5.929
$\zeta$ Aurigæ . . . . .	3.9	4	55	58.512	+ 4.1882	+ 40	56	26.67	+ 5.506
II Orionis . . . . .	4.7	4	59	15.239	3.4260	+ 15	16	30.39	5.216
$\beta$ Eridani . . . . .	2.9	5	3	16.657	2.9488	- 5	12	22.18	4.837
$\alpha$ Aurigæ ( <i>Capella</i> )	0.1	5	9	49.024	4.4275	+ 45	54	14.72	3.926
$\beta$ Orionis ( <i>Rigel</i> ) . . . . .	0.3	5	10	4.070	2.8820	- 8	18	30.97	4.333
$\tau$ Orionis . . . . .	3.8	5	13	5.427	+ 2.9122	- 6	56	39.96	+ 4.070
$\beta$ Tauri . . . . .	1.8	5	20	24.725	3.7907	+ 28	31	46.10	3.269
$\chi$ Aurigæ . . . . .	5.0	5	26	40.434	3.9033	+ 32	7	25.69	2.892
$\delta$ Orionis ( <i>var.</i> ) . . . . .	2.3	5	27	15.296	3.0640	- 0	22	2.99	2.852
Groombridge 966 . . . . .	6.4	5	27	16.997	8.0034	+ 74	59	0.32	2.869
$\alpha$ Leporis . . . . .	2.7	5	28	37.700	+ 2.6455	- 17	53	18.41	+ 2.735
$\epsilon$ Orionis . . . . .	1.8	5	31	29.641	3.0433	- 1	15	38.87	2.488
Groombridge 944 . . . . .	6.4	5	32	5.299	18.7255	+ 85	9	7.29	2.431
$\alpha$ Columbæ . . . . .	2.7	5	36	16.885	2.1723	- 34	7	24.16	2.033
$\kappa$ Orionis . . . . .	2.3	5	43	20.738	2.8447	- 9	42	7.97	1.452
$\delta$ Doradus . . . . .	4.4	5	44	36.293	+ 0.1015	- 65	46	13.44	+ 1.345
$\nu$ Aurigæ . . . . .	4.1	5	45	2.626	4.1569	+ 39	7	18.78	1.320
$\alpha$ Orionis ( <i>var.</i> ) . . . . .	0.9	5	50	8.205	+ 3.2476	+ 7	23	24.84	+ 0.872

MEAN PLACES FOR 1907.0. (January 0<sup>d</sup>.795, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
$\beta$ Aurigæ . . . . .	2.0	5	52	42.447	+ 4.4015	+ 44	56	19.22	+ 0.632
$\theta$ Aurigæ . . . . .	2.9	5	53	22.769	4.0914	+ 37	12	23.97	+ 0.488
$\nu$ Orionis . . . . .	4.5	6	2	15.747	3.4263	+ 14	46	48.27	- 0.223
22 Camelopardalis (H.) . . . . .	4.7	6	8	36.037	6.6194	+ 69	21	12.61	0.866
$\eta$ Geminorum . . . . .	3.5	6	9	15.872	3.6227	+ 22	32	3.44	0.826
$\mu$ Geminorum . . . . .	3.2	6	17	20.079	+ 3.6308	+ 22	33	42.86	- 1.629
$\psi$ Aurigæ . . . . .	5.1	6	17	44.277	4.6264	+ 49	20	9.89	1.553
$\alpha$ Argûs ( <i>Canopus</i> ) . . . . .	-0.8	6	21	53.246	1.3318	- 52	38	40.92	1.903
$\nu$ Geminorum . . . . .	4.2	6	23	26.475	3.5630	+ 20	16	17.64	2.063
$\gamma$ Geminorum . . . . .	2.0	6	32	20.393	3.4672	+ 16	28	44.99	2.867
$\epsilon$ Geminorum . . . . .	3.2	6	38	12.660	+ 3.6932	+ 25	13	25.67	- 3.345
$\psi$ Aurigæ . . . . .	5.4	6	40	2.319	4.3306	+ 43	40	14.25	3.324
† $\alpha$ Canis Majoris ( <i>Sirius</i> ) . . . . .	-1.4	6	41	2.999	2.6435	- 16	35	17.42	4.778
$\theta$ Geminorum . . . . .	3.7	6	46	39.661	+ 3.9588	+ 34	4	26.33	4.103
$\zeta$ Mensæ . . . . .	5.6	6	47	47.917	- 4.9296	- 80	42	57.82	4.069
$\epsilon$ Canis Majoris . . . . .	1.5	6	54	58.243	+ 2.3573	- 28	50	42.34	- 4.759
51 Cephei (H.) . . . . .	5.3	6	57	10.87*	29.4592	+ 87	11	46.65	4.985
$\zeta$ Geminorum ( <i>var.</i> ) . . . . .	4.0	6	58	35.640	3.5611	+ 20	42	26.07	5.077
$\delta$ Canis Majoris . . . . .	1.9	7	4	36.550	2.4380	- 26	14	42.47	5.573
63 Aurigæ . . . . .	5.2	7	5	15.657	+ 4.1340	+ 39	28	22.32	5.634
$\gamma$ Volantis ( <i>var.</i> ) . . . . .	3.9	7	9	32.282	- 0.4986	- 70	20	52.61	- 5.912
25 Camelopardalis (H.) . . . . .	5.3	7	11	33.880	+ 12.8682	+ 82	35	33.06	6.205
$\delta$ Geminorum . . . . .	3.5	7	14	34.218	3.5871	+ 22	9	14.82	6.423
Piazzii vii, 67 . . . . .	5.7	7	21	12.736	6.2818	+ 68	39	23.33	7.001
$\beta$ Canis Minoris . . . . .	3.1	7	22	6.494	3.2558	+ 8	28	37.91	7.076
$\alpha^2$ Geminorum ( <i>Castor</i> ) . . . . .	1.9	7	28	40.066	+ 3.8343	+ 32	5	35.78	- 7.645
† $\alpha$ Canis Min. ( <i>Procyon</i> ) . . . . .	0.5	7	34	26.053	3.1425	+ 5	27	49.23	9.066
$\beta$ Geminorum ( <i>Pollux</i> ) . . . . .	1.2	7	39	37.608	3.6768	+ 28	15	4.84	8.498
$\varphi$ Geminorum . . . . .	5.0	7	47	48.465	3.6777	+ 27	0	25.51	9.112
26 Lyncis . . . . .	5.8	7	47	56.710	4.3839	+ 47	48	22.69	9.102
Groombridge 1374 . . . . .	5.6	7	49	4.793	+ 7.2590	+ 74	10	2.18	- 9.222
$\omega$ Cancri . . . . .	6.0	7	55	18.332	3.6350	+ 25	38	52.37	9.669
3 Ursæ Majoris (H.) . . . . .	5.5	8	3	34.086	6.0216	+ 68	44	55.11	10.287
15 Argûs ( $\rho$ ) . . . . .	3.1	8	3	34.991	2.5545	- 24	2	8.62	10.241
$\zeta$ Cancri . . . . .	4.8	8	6	52.793	3.4454	+ 17	55	43.64	10.668
$\beta$ Cancri . . . . .	3.8	8	11	28.356	+ 3.2562	+ 9	28	21.45	- 10.932
30 Monocerotis . . . . .	3.9	8	21	0.871	+ 2.9999	- 3	36	9.35	11.590
$\theta$ Chamæleontis . . . . .	4.6	8	23	26.543	- 1.7339	- 77	11	5.06	11.727
$\eta$ Cancri . . . . .	5.4	8	27	19.961	+ 3.4754	+ 20	45	27.05	12.073
$\sigma$ Hydræ . . . . .	4.5	8	33	53.860	3.1387	+ 3	40	6.22	12.485
$\gamma$ Cancri . . . . .	4.9	8	37	54.382	+ 3.4780	+ 21	48	12.24	- 12.788
$\epsilon$ Hydræ . . . . .	3.5	8	41	51.141	3.1803	+ 6	45	37.70	13.058
$\alpha^2$ Cancri ( <i>mean</i> ) . . . . .	5.5	8	48	34.404	3.6697	+ 30	55	55.41	13.472
$\iota$ Ursæ Majoris . . . . .	3.3	8	52	50.718	4.1263	+ 48	24	26.19	13.974
$\alpha^2$ Ursæ Majoris . . . . .	5.0	9	2	13.381	5.3328	+ 67	30	45.58	14.378
$\kappa$ Cancri . . . . .	5.1	9	2	42.694	+ 3.2534	+ 11	2	34.19	- 14.354
$\theta$ Hydræ . . . . .	4.0	9	9	31.622	3.1241	+ 2	42	25.34	15.064
$\beta$ Argûs . . . . .	2.0	9	12	10.954	+ 0.6728	- 69	20	2.66	- 14.815

† Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

MEAN PLACES FOR 1907.0. (January 0<sup>d</sup>.795, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
$\epsilon$ Argûs . . . . .	2.6	9	14	35.949	+ 1.6042	- 58	53	5.07	- 15.042
$\alpha$ Lyncis . . . . .	3.3	9	15	23.562	3.6656	+ 34	47	10.39	15.082
$\alpha$ Hydræ . . . . .	2.1	9	23	1.064	2.9488	- 8	15	18.39	15.492
1 Draconis (H.) . . . .	4.5	9	23	53.481	8.8622	+ 81	44	17.91	15.600
$\delta$ Ursæ Majoris . . . .	4.8	9	26	16.525	5.3736	+ 70	14	22.61	15.632
$\theta$ Ursæ Majoris . . . .	3.2	9	26	38.595	+ 4.0348	+ 52	6	5.95	- 16.267
10 Leonis Minoris . . . .	4.7	9	28	31.792	3.6875	+ 36	48	39.18	15.846
$\sigma$ Leonis . . . . .	3.8	9	36	11.317	+ 3.2057	+ 10	18	56.99	16.261
$\zeta$ Chamæleontis . . . .	5.2	9	36	38.770	- 1.6272	- 80	31	24.58	16.232
$\epsilon$ Leonis . . . . .	3.2	9	40	34.478	+ 3.4124	+ 24	12	9.88	16.472
$\mu$ Leonis . . . . .	4.0	9	47	28.578	+ 3.4187	+ 26	26	43.06	- 16.842
19 Leonis Minoris . . . .	5.2	9	51	59.537	3.6879	+ 41	29	56.00	17.022
$\pi$ Leonis . . . . .	5.0	9	55	17.995	3.1729	+ 8	29	26.59	17.178
$\alpha$ Leonis ( <i>Regulus</i> ) . . .	1.3	10	3	25.236	3.1990	+ 12	25	19.20	17.510
32 Ursæ Majoris . . . .	5.7	10	11	17.470	4.4024	+ 65	34	21.44	17.845
$\lambda$ Ursæ Majoris . . . .	3.6	10	11	29.575	+ 3.6341	+ 43	22	44.87	- 17.880
$\gamma$ Leonis . . . . .	2.5	10	14	50.818	3.3128	+ 20	18	44.06	18.125
$\mu$ Hydræ . . . . .	4.1	10	21	35.532	2.9002	- 16	21	40.53	18.306
$\beta$ Leonis Minoris . . . .	4.3	10	22	30.578	3.4815	+ 37	11	2.23	18.372
$\alpha$ Antliæ . . . . .	4.5	10	22	53.694	2.7416	- 30	35	39.51	18.297
9 Draconis (H.) . . . .	5.0	10	27	12.823	+ 5.2061	+ 76	11	32.54	- 18.435
$\rho$ Leonis . . . . .	4.0	10	27	54.941	3.1622	+ 9	47	7.55	18.453
41 Leonis Minoris . . . .	5.1	10	38	21.700	3.2684	+ 23	40	31.78	18.778
$\eta$ Argûs ( <i>var.</i> ) . . . .	1-6	10	41	27.033	2.3190	- 59	11	43.63	18.890
1 Leonis . . . . .	5.3	10	44	22.219	3.1571	+ 11	2	14.71	18.998
$\delta$ Chamæleontis . . . .	4.7	10	44	55.045	+ 0.6021	- 80	2	58.79	- 18.984
46 Leonis Minoris . . . .	3.9	10	48	6.830	3.3656	+ 34	42	59.29	19.351
Groombridge 1706 . . . .	6.3	10	52	32.269	4.9130	+ 78	16	6.83	19.219
$\alpha$ Ursæ Majoris . . . .	2.0	10	57	59.822	+ 3.7350	+ 62	15	11.65	19.388
$\eta$ Octantis . . . . .	6.1	10	59	58.74*	- 0.3290	- 84	5	36.94	19.368
$\rho$ Leonis . . . . .	6.2	11	2	9.632	+ 3.0615	+ 2	27	38.23	- 19.491
$\psi$ Ursæ Majoris . . . .	3.2	11	4	26.376	3.3880	+ 45	0	11.79	19.493
$\delta$ Leonis . . . . .	2.7	11	9	9.867	3.1963	+ 21	2	0.01	19.696
$\nu$ Ursæ Majoris . . . .	3.7	11	13	27.511	3.2498	+ 33	36	6.87	19.608
$\delta$ Crateris . . . . .	3.9	11	14	41.404	2.9969	- 14	16	30.55	19.461
$\tau$ Leonis . . . . .	5.1	11	23	9.298	+ 3.0859	+ 3	22	6.75	- 19.804
$\lambda$ Draconis . . . . .	4.0	11	25	53.633	3.6051	+ 69	50	40.04	19.845
$\xi$ Hydræ . . . . .	3.8	11	28	25.547	2.9449	- 31	20	34.88	19.911
$\nu$ Leonis . . . . .	4.4	11	32	11.226	3.0715	- 0	18	36.72	19.860
$\chi$ Ursæ Majoris . . . .	3.9	11	41	8.638	3.1829	+ 48	17	42.34	19.959
$\beta$ Leonis . . . . .	2.2	11	44	19.027	+ 3.0630	+ 15	5	31.11	- 20.118
$\gamma$ Ursæ Majoris . . . .	2.4	11	48	56.640	3.1734	+ 54	12	42.66	20.019
$\pi$ Virginis . . . . .	4.6	11	56	6.437	3.0744	+ 7	7	58.47	20.075
$\sigma$ Virginis . . . . .	4.3	12	0	28.337	3.0573	+ 9	14	58.08	20.014
$\epsilon$ Corvi . . . . .	3.2	12	5	20.399	3.0800	- 22	6	9.21	20.038
4 Draconis (H.) . . . .	5.1	12	7	51.138	+ 2.8572	+ 78	7	58.85	- 20.015
$\gamma$ Corvi . . . . .	2.7	12	11	1.291	3.0807	- 17	1	31.78	20.007
2 Canum Venaticorum . .	6.0	12	11	28.188	+ 3.0178	+ 41	10	39.92	- 20.067

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Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
$\beta$ Chamæleontis . . . . .	4.5	12	12	52.405	+ 3.4325	- 78	47	44.97	- 19.998
6 Ursæ Minoris (B.) . . . . .	6.2	12	14	25.030	0.3019	+ 88	12	55.56	19.948
$\eta$ Virginis . . . . .	4.0	12	15	8.875	3.0691	- 0	9	0.03	20.030
$\alpha^2$ Crucis . . . . .	0.9	12	21	25.082	3.3065	- 62	35	1.47	19.998
$\delta^*$ Corvi . . . . .	3.1	12	25	3.057	3.1002	- 15	59	51.76	20.075
$\beta$ Canum Venaticorum . . . . .	4.4	12	29	19.768	+ 2.8579	+ 41	51	45.81	- 19.603
$\beta$ Corvi . . . . .	2.8	12	29	29.956	3.1441	- 22	52	57.02	19.942
$\kappa$ Draconis . . . . .	3.8	12	29	31.133	2.5818	+ 70	18	2.93	19.870
$\gamma$ Virginis ( <i>mean</i> ) . . . . .	2.9	12	36	56.893	3.0394	- 0	56	21.84	19.782
31 Comæ Berenices . . . . .	5.1	12	47	10.164	2.9247	+ 28	2	47.95	19.647
32 <sup>a</sup> Camelopardalis (H.) . . . . .	5.2	12	48	26.090	+ 0.4227	+ 83	55	6.30	- 19.584
$\alpha$ Canum Venaticorum . . . . .	3.2	12	51	40.746	2.8118	+ 38	49	13.84	19.490
$\delta$ Muscæ . . . . .	3.8	12	55	51.573	4.0611	- 71	2	50.39	19.485
$\epsilon$ Virginis . . . . .	3.1	12	57	32.849	2.9865	+ 11	27	31.93	19.403
$\theta$ Virginis . . . . .	4.6	13	5	8.005	3.1026	- 5	2	33.51	19.282
20 Canum Venaticorum . . . . .	4.7	13	13	22.488	+ 2.6966	+ 41	3	43.67	- 19.013
$\alpha$ Virginis ( <i>Spica</i> ) . . . . .	1.1	13	20	17.523	3.1561	- 10	40	33.67	18.861
$\kappa$ Octantis . . . . .	5.4	13	25	44.30*	8.9496	- 85	18	35.64	18.683
$\zeta$ Virginis . . . . .	3.6	13	29	57.191	3.0540	- 0	7	14.03	18.482
B. A. C. 4536 . . . . .	5.0	13	30	38.752	2.6824	+ 37	39	31.49	18.503
<i>m</i> Virginis . . . . .	5.4	13	36	43.752	+ 3.1443	- 8	14	2.11	- 18.255
$\eta$ Ursæ Majoris . . . . .	1.9	13	43	52.659	2.3687	+ 49	46	37.94	18.045
$\eta$ Bootis . . . . .	2.8	13	50	15.400	2.8568	+ 18	51	49.21	18.134
$\theta$ Apodis ( <i>var.</i> ) . . . . .	5.0	13	56	14.390	5.7159	- 76	20	53.51	17.551
$\beta$ Centauri . . . . .	0.7	13	57	15.200	4.1990	- 59	55	28.55	17.512
$\pi$ Hydræ . . . . .	3.6	14	1	4.356	+ 3.4076	- 26	14	4.71	- 17.460
$\alpha$ Draconis . . . . .	3.7	14	1	52.311	1.6240	+ 64	49	12.62	17.267
$\delta$ Bootis . . . . .	4.8	14	6	9.588	2.7401	+ 25	31	54.82	17.163
$\kappa$ Virginis . . . . .	4.2	14	7	55.991	+ 3.1958	- 9	50	28.00	16.871
4 Ursæ Minoris . . . . .	4.9	14	9	11.912	- 0.2935	+ 77	59	4.07	16.919
$\alpha$ Bootis ( <i>Arcturus</i> ) . . . . .	0.2	14	11	25.147	+ 2.7353	+ 19	39	58.71	- 18.843
$\delta$ Octantis . . . . .	5.0	14	11	55.647	9.1615	- 83	14	33.09	16.829
$\lambda$ Bootis . . . . .	4.3	14	12	50.973	2.2835	+ 46	30	54.38	16.621
$\lambda$ Virginis . . . . .	4.7	14	14	4.508	3.2397	- 12	56	35.92	16.692
$\theta$ Bootis . . . . .	4.1	14	22	1.896	+ 2.0434	+ 52	16	49.34	16.723
5 Ursæ Minoris . . . . .	4.5	14	27	42.641	- 0.1720	+ 76	6	34.18	- 16.004
$\rho$ Bootis . . . . .	3.6	14	27	49.343	+ 2.5866	+ 30	46	45.67	15.905
$\alpha^2$ Centauri . . . . .	0.2	14	33	16.528	4.0488	- 60	27	6.86	15.001
33 Bootis . . . . .	5.3	14	35	22.627	2.2343	+ 44	48	19.99	15.656
$\alpha$ Apodis . . . . .	4.1	14	36	16.150	7.2599	- 78	39	1.93	15.588
$\epsilon$ Bootis . . . . .	2.6	14	40	55.532	+ 2.6203	+ 27	27	57.39	- 15.295
$\alpha^2$ Libræ . . . . .	2.9	14	45	43.875	+ 3.3125	- 15	39	20.31	15.106
$\beta$ Ursæ Minoris . . . . .	2.2	14	50	58.136	- 0.2126	+ 74	32	8.02	14.720
$\beta$ Bootis . . . . .	3.7	14	58	26.582	+ 2.2600	+ 40	45	25.44	14.311
$\gamma$ Scorpii . . . . .	3.4	14	58	37.470	3.5032	- 24	55	0.30	14.307
$\delta$ Bootis . . . . .	3.5	15	11	45.213	+ 2.4192	+ 33	39	41.00	- 13.555
$\beta$ Libræ . . . . .	2.9	15	12	0.048	+ 3.2239	- 9	2	24.53	13.438
$\gamma^2$ Ursæ Minoris . . . . .	3.2	15	20	52.239	- 0.1216	+ 72	9	53.63	- 12.814

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Name of Star.	Magni- tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ' "	"
$\mu^1$ Bootis . . . . .	4.5	15 20 58.632	+ 2.2662	+ 37 42 10.77	- 12.739
$\rho$ Octantis . . . . .	5.7	15 21 43.66*	13.2231	- 84 9 24.24	12.690
$\beta$ Coronæ Borealis . . . . .	3.9	15 23 59.685	2.4737	+ 29 25 33.33	12.538
$\alpha$ Coronæ Borealis . . . . .	2.3	15 30 44.998	2.5392	+ 27 1 38.17	12.251
$\alpha$ Serpentis . . . . .	2.7	15 39 41.173	2.9525	+ 6 43 4.10	11.478
$\epsilon$ Serpentis . . . . .	3.7	15 46 10.743	+ 2.9878	+ 4 45 26.49	- 10.982
$\zeta$ Ursæ Minoris . . . . .	4.6	15 47 21.787	- 2.2196	+ 78 4 51.19	10.968
$\epsilon$ Coronæ Borealis . . . . .	4.1	15 53 44.187	+ 2.4821	+ 27 8 48.36	10.561
$\delta$ Scorpii . . . . .	2.6	15 54 49.913	3.5410	- 22 21 26.95	10.447
$\beta^1$ Scorpii . . . . .	2.9	16 0 1.609	3.4824	- 19 33 4.73	10.049
$\varphi$ Herculis . . . . .	4.2	16 5 50.368	+ 1.8894	+ 45 10 42.41	- 9.541
Groombridge 2320 . . . . .	5.5	16 6 3.955	0.1496	+ 68 3 18.07	9.508
$\delta^1$ Apodis . . . . .	4.9	16 6 25.288	8.8266	- 78 27 45.11	9.588
$\delta$ Ophiuchi . . . . .	2.8	16 9 28.244	3.1408	- 3 27 19.00	9.441
$\sigma$ Coronæ Borealis . . . . .	5.3	16 11 11.731	2.2456	+ 34 5 38.60	9.235
$\tau$ Herculis . . . . .	3.9	16 16 56.726	+ 1.8027	+ 46 32 4.17	- 8.684
$\gamma$ Apodis . . . . .	4.0	16 19 9.696	+ 9.0769	- 78 41 21.83	8.620
$\eta$ Ursæ Minoris . . . . .	5.0	16 20 12.680	- 1.7995	+ 75 58 11.69	8.203
$\eta$ Draconis . . . . .	2.8	16 22 43.817	+ 0.8064	+ 61 43 28.37	8.197
$\alpha$ Scorpii ( <i>Antares</i> ) . . . . .	1.2	16 23 42.186	3.6730	- 26 13 33.95	8.206
$\beta$ Herculis . . . . .	2.8	16 26 13.258	+ 2.5771	+ 21 41 30.33	- 8.000
A Draconis . . . . .	5.0	16 28 9.634	- 0.1329	+ 68 58 9.69	7.784
$\zeta$ Ophiuchi . . . . .	2.8	16 32 2.189	+ 3.3001	- 10 22 45.05	7.484
$\alpha$ Trianguli Australis . . . . .	2.2	16 38 48.547	6.3165	- 68 51 27.87	7.003
$\eta$ Herculis . . . . .	3.7	16 39 42.427	2.0555	+ 39 5 55.36	6.973
$\kappa$ Ophiuchi . . . . .	3.4	16 53 15.934	+ 2.8379	+ 9 31 8.86	- 5.766
$\epsilon$ Ursæ Minoris . . . . .	4.5	16 55 28.161	- 6.2833	+ 82 11 28.90	5.571
$d$ Herculis . . . . .	5.3	16 58 10.297	+ 2.2118	+ 33 42 8.84	5.351
$\eta$ Ophiuchi . . . . .	2.5	17 5 2.578	3.4369	- 15 36 36.79	4.670
$\alpha^1$ Herculis ( <i>var.</i> ) . . . . .	3.2	17 10 24.386	2.7342	+ 14 29 45.01	4.275
$\pi$ Herculis . . . . .	3.4	17 11 48.432	+ 2.0882	+ 36 54 48.84	- 4.185
$\theta$ Ophiuchi . . . . .	3.3	17 16 17.805	3.6811	- 24 54 26.05	3.835
$b$ Ophiuchi ( <i>var.</i> ) . . . . .	4.4	17 20 41.341	3.6603	- 24 5 25.35	3.559
$\delta$ Aræ . . . . .	3.8	17 22 41.987	5.4038	- 60 36 25.76	3.368
$\beta$ Draconis . . . . .	3.0	17 28 19.852	1.3538	+ 52 22 11.89	2.752
$\alpha$ Ophiuchi . . . . .	2.2	17 30 37.021	+ 2.7835	+ 12 37 37.91	- 2.798
$\iota$ Herculis . . . . .	4.0	17 36 50.392	+ 1.6933	+ 46 3 19.89	2.019
$\omega$ Draconis . . . . .	4.9	17 37 29.685	- 0.3551	+ 68 48 3.51	1.647
$\mu$ Herculis . . . . .	3.5	17 42 49.103	+ 2.3467	+ 27 46 28.76	2.250
$\psi^1$ Draconis . . . . .	4.8	17 43 35.407	- 1.0758	+ 72 11 40.78	1.702
$\theta$ Herculis . . . . .	3.9	17 53 3.807	+ 2.0568	+ 37 15 44.79	- 0.602
$\gamma$ Draconis . . . . .	2.5	17 54 26.793	1.3923	+ 51 29 58.35	0.510
$\gamma^1$ Sagittarii . . . . .	2.9	17 59 49.963	+ 3.8518	- 30 25 32.72	- 0.213
$\delta$ Ursæ Minoris . . . . .	4.4	18 2 16.28*	- 19.4955	+ 86 36 50.13	+ 0.246
$\sigma$ Herculis . . . . .	3.9	18 3 54.865	+ 2.3392	+ 28 44 57.34	0.344
$\mu$ Sagittarii . . . . .	4.1	18 8 12.073	+ 3.5869	- 21 5 1.26	+ 0.716
$\eta$ Serpentis . . . . .	3.5	18 16 29.820	3.1026	- 2 55 24.18	0.750
$\lambda$ Sagittarii . . . . .	2.9	18 22 13.884	+ 3.7028	- 25 28 25.33	+ 1.743

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		h m s	s	° ' "	"
χ Draconis . . . . .	3.8	18 22 44.135	- 1.0779	+ 72 41 33.36	+ 1.612
ι Aquilæ . . . . .	4.0	18 30 8.773	+ 3.2646	- 8 18 34.43	2.314
ζ Pavonis . . . . .	4.2	18 32 10.222	7.0235	- 71 30 31.11	2.640
α Lyræ ( <i>Vega</i> ) . . . . .	0.2	18 33 47.381	2.0313	+ 38 41 48.21	3.225
β Lyræ ( <i>var.</i> ) . . . . .	3.6	18 46 38.772	+ 2.2146	+ 33 15 15.48	4.047
50 Draconis . . . . .	5.6	18 49 22.767	- 1.9156	+ 75 19 27.88	+ 4.337
σ Sagittarii . . . . .	2.3	18 49 29.912	+ 3.7205	- 26 24 46.13	4.221
γ Lyræ . . . . .	3.3	18 55 27.863	2.2434	+ 32 33 41.59	4.799
ζ Aquilæ . . . . .	3.1	19 1 8.129	2.7569	+ 13 43 29.08	5.185
ι Lyræ . . . . .	5.2	19 3 59.008	2.1411	+ 35 57 13.93	5.518
σ Octantis . . . . .	5.6	19 11 30.26*	+ 99.5167	- 89 14 36.83	+ 6.153
δ Sagittarii . . . . .	5.0	19 12 11.647	3.5115	- 19 7 8.06	6.194
δ Draconis . . . . .	3.1	19 12 32.184	0.0242	+ 67 29 52.58	6.327
θ Lyræ . . . . .	4.4	19 13 8.380	+ 2.0807	+ 37 58 4.09	6.296
λ Ursæ Minoris . . . . .	6.5	19 14 28.36*	- 69.6521	+ 89 0 3.00	6.407
τ Draconis . . . . .	4.5	19 17 20.875	- 1.1309	+ 73 10 58.97	+ 6.747
δ Aquilæ . . . . .	3.5	19 20 48.569	+ 3.0251	+ 2 55 43.97	7.004
β Cygni . . . . .	3.1	19 26 58.237	2.4188	+ 27 45 50.08	7.416
κ Aquilæ . . . . .	5.0	19 31 53.348	3.2292	- 7 14 4.61	7.826
β Sagittæ . . . . .	4.5	19 36 52.304	2.6939	+ 17 15 36.58	8.191
γ Aquilæ . . . . .	2.8	19 41 50.298	+ 2.8520	+ 10 23 10.16	+ 8.614
δ Cygni . . . . .	2.9	19 42 4.137	1.8760	+ 44 54 12.32	8.680
α Aquilæ ( <i>Altair</i> ) . . . . .	0.9	19 46 14.752	+ 2.9273	+ 8 37 19.98	9.342
ε Draconis . . . . .	3.9	19 48 29.613	- 0.1841	+ 70 1 51.75	9.166
ε Pavonis . . . . .	4.1	19 49 50.785	+ 7.0005	- 73 9 23.36	9.124
β Aquilæ . . . . .	3.9	19 50 44.707	+ 2.9469	+ 6 10 26.56	+ 8.833
γ Sagittæ . . . . .	3.6	19 54 37.258	2.6673	+ 19 14 20.90	9.638
ζ Sagittarii . . . . .	4.5	19 56 56.473	3.6941	- 27 58 7.92	9.804
τ Aquilæ . . . . .	5.7	19 59 35.827	2.9309	+ 7 0 54.96	10.022
θ Aquilæ . . . . .	3.3	20 6 30.410	3.0963	- 1 5 51.84	10.517
31 Cygni . . . . .	3.9	20 10 42.231	+ 1.8901	+ 46 27 32.32	+ 10.828
κ Cephei ( <i>pr.</i> ) . . . . .	4.4	20 12 2.133	- 1.9518	+ 77 25 53.84	10.946
α Capricorni . . . . .	3.7	20 12 53.739	+ 3.3311	- 12 50 0.65	10.991
α Pavonis . . . . .	2.1	20 18 17.677	4.7691	- 57 2 0.98	11.283
γ Cygni . . . . .	2.3	20 18 53.422	2.1525	+ 39 57 31.15	11.419
π Capricorni . . . . .	5.1	20 21 59.948	+ 3.4372	- 18 31 0.87	+ 11.638
ε Delphini . . . . .	4.0	20 28 46.213	+ 2.8665	+ 10 59 12.31	12.093
Groombridge 3241 . . . . .	6.5	20 30 24.889	- 0.2332	+ 72 12 59.87	12.214
α Delphini . . . . .	3.9	20 35 19.120	+ 2.7868	+ 15 35 1.60	12.586
β Pavonis . . . . .	3.4	20 36 35.214	5.4525	- 66 32 16.72	12.652
α Cygni . . . . .	1.4	20 38 15.672	+ 2.0445	+ 44 56 51.62	+ 12.766
ψ Capricorni . . . . .	4.3	20 40 35.480	3.5580	- 25 36 19.15	12.777
ε Cygni . . . . .	2.6	20 42 26.895	2.4273	+ 33 37 17.60	13.375
μ Aquarii . . . . .	4.8	20 47 38.326	+ 3.2384	- 9 19 57.86	13.351
12 Year Catalogue 1879 . . . . .	5.3	20 51 49.908	- 2.6027	+ 80 12 14.13	13.636
ν Cygni . . . . .	4.1	20 53 42.335	+ 2.2353	+ 40 48 31.43	+ 13.762
61 Cygni . . . . .	5.4	21 2 43.614	2.6849	+ 38 17 30.10	17.588
ζ Cygni . . . . .	3.3	21 8 58.656	+ 2.5517	+ 29 50 42.32	+ 14.658



MEAN PLACES FOR 1907.0. (January 0<sup>d</sup>.795, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
$\tau$ Cygni . . . .	3.8	21	11	4.697	+ 2.3936	+ 37	38	53.23	+ 15.277
$\alpha$ Cephei . . . .	2.6	21	16	21.671	1.4355	+ 62	11	28.87	15.199
$\iota$ Pegasi . . . .	4.3	21	17	47.124	2.7739	+ 19	24	22.62	15.295
$\zeta$ Capricorni . . . .	3.8	21	21	21.585	3.4316	- 22	48	52.08	15.452
$\beta$ Aquarii . . . .	2.9	21	26	39.841	3.1605	- 5	58	50.39	15.714
$\beta$ Cephei ( <i>pr.</i> ) . . . .	3.4	21	27	27.861	+ 0.7888	+ 70	9	8.46	+ 15.773
$\xi$ Aquarii . . . .	4.8	21	32	48.130	3.1963	- 8	16	17.71	16.029
74 Cygni . . . .	5.0	21	33	13.260	2.4028	+ 39	59	43.58	16.083
$\lambda^1$ Octantis . . . .	5.4	21	36	43.881	9.6193	- 83	8	49.82	16.243
$\epsilon$ Pegasi . . . .	2.4	21	39	37.091	2.9462	+ 9	26	53.85	16.401
$\iota$ Cephei . . . .	4.8	21	40	33.724	+ 0.8908	+ 70	52	59.05	+ 16.542
$\pi^a$ Cygni . . . .	4.5	21	43	21.397	2.2138	+ 48	52	44.48	16.586
$\mu$ Capricorni . . . .	5.2	21	48	13.607	3.2739	- 13	59	23.79	16.824
16 Pegasi . . . .	5.1	21	48	49.799	2.7280	+ 25	29	14.53	16.857
79 Draconis . . . .	6.6	21	51	42.044	0.7227	+ 73	15	43.95	17.002
$\alpha$ Aquarii . . . .	3.0	22	1	0.474	+ 3.0824	- 0	46	18.75	+ 17.402
$\alpha$ Gruis . . . .	1.9	22	2	22.525	3.7973	- 47	24	42.45	17.289
$\pi^a$ Pegasi . . . .	4.3	22	5	51.372	2.6619	+ 32	43	17.84	17.592
$\theta$ Aquarii . . . .	4.4	22	11	55.620	3.1678	- 8	14	47.63	17.840
$\nu$ Octantis . . . .	6.2	22	14	4.05*	12.6146	- 86	26	27.71	18.017
$\gamma$ Aquarii . . . .	4.0	22	16	51.193	+ 3.0994	- 1	51	21.97	+ 18.065
$\pi$ Aquarii . . . .	4.6	22	20	31.652	3.0640	+ 0	54	18.74	18.187
$\sigma$ Aquarii . . . .	4.9	22	25	43.617	3.1778	- 11	9	14.44	18.349
$\alpha$ Lacertæ . . . .	3.9	22	27	27.525	2.4667	+ 49	48	14.89	18.447
$\eta$ Aquarii . . . .	4.2	22	30	34.671	3.0834	- 0	35	49.24	18.487
226 Cephei (B.) . . . .	5.7	22	30	38.573	+ 1.0676	+ 75	44	49.57	+ 18.542
10 Lacertæ . . . .	5.0	22	35	5.218	2.6878	+ 38	33	57.63	18.675
$\beta$ Octantis . . . .	4.4	22	36	35.606	6.3717	- 81	52	9.85	18.735
$\zeta$ Pegasi . . . .	3.5	22	36	49.412	2.9912	+ 10	20	44.33	18.727
$\lambda$ Pegasi . . . .	4.1	22	42	3.016	2.8863	+ 23	4	33.82	18.889
$\iota$ Cephei . . . .	3.6	22	46	22.035	+ 2.1262	+ 65	42	39.99	+ 18.895
$\lambda$ Aquarii . . . .	3.8	22	47	45.802	3.1314	- 8	4	28.71	19.094
$\alpha$ Pis. Austr. ( <i>Fomalhaut</i> ) . . . .	1.3	22	52	30.834	3.3226	- 30	6	55.17	19.012
$\alpha$ Andromedæ . . . .	3.8	22	57	38.376	2.7530	+ 41	49	33.66	19.299
$\alpha$ Pegasi ( <i>Markab</i> ) . . . .	2.5	23	0	7.641	2.9859	+ 14	42	17.09	19.327
$\phi$ Aquarii . . . .	4.3	23	9	30.377	+ 3.1075	- 6	33	1.78	+ 19.367
$\sigma$ Cephei . . . .	5.1	23	14	48.165	2.4484	+ 67	36	9.28	19.675
$\tau$ Pegasi . . . .	4.6	23	16	1.931	2.9649	+ 23	13	52.16	19.667
$\theta$ Piscium . . . .	4.3	23	23	14.999	3.0418	+ 5	52	5.23	19.748
$\lambda$ Andromedæ . . . .	3.8	23	33	0.555	2.9259	+ 45	57	15.32	19.487
$\iota$ Piscium . . . .	4.3	23	35	9.982	+ 3.0841	+ 5	7	19.83	+ 19.493
$\gamma$ Cephei . . . .	3.5	23	35	31.494	2.4326	+ 77	6	47.92	20.089
$\iota^1$ Aquarii . . . .	5.2	23	39	22.749	3.1152	- 18	47	35.53	19.960
$\delta$ Sculptoris . . . .	4.6	23	44	4.958	3.1290	- 28	38	41.54	19.865
$\gamma^1$ Octantis . . . .	5.2	23	46	40.173	3.6406	- 82	32	8.44	20.001
Groombridge 4163 . . . .	6.6	23	50	17.693	+ 2.8726	+ 73	53	33.98	+ 20.024
$\omega$ Piscium . . . .	4.2	23	54	32.104	+ 3.0791	+ 6	20	54.59	+ 19.933

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (Hæ.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Jan.	h m 1 25	° +88 48	Jan.	h m 6 57	° +87 11	Jan.	h m 12 14	° +88 12	Jan.	h m 18 1	° +86 36	Jan.	h m 19 13	° +88 59
	s	"		s	"		s	"		s	"		s	"
0.3	58.89	50.3	0.5	28.43	40.5	0.7	16.97	41.1	0.9	58.95	52.6	1.0	37.40	69.9
1.3	57.79	50.4	1.5	28.58	40.9	1.7	17.79	41.1	1.9	58.96	52.2	2.0	36.95	69.5
2.3	56.65	50.5	2.5	28.71	41.2	2.7	18.62	41.0	2.9	59.00	51.8	3.0	36.57	69.2
3.3	55.49	50.7	3.5	28.80	41.6	3.7	19.44	41.0	3.9	59.06	51.4	4.0	36.28	68.8
4.3	54.36	50.8	4.5	28.88	42.0	4.7	20.22	41.1	4.9	59.14	51.0	5.0	36.06	68.4
5.3	53.27	50.8	5.5	28.94	42.3	5.7	20.95	41.1	5.9	59.21	50.7	6.0	35.90	68.1
6.3	52.23	50.9	6.5	28.98	42.6	6.7	21.65	41.2	6.9	59.27	50.4	7.0	35.74	67.8
7.3	51.24	50.9	7.5	29.02	42.9	7.7	22.32	41.2	7.9	59.34	50.0	8.0	35.57	67.5
8.3	50.29	51.0	8.5	29.08	43.2	8.7	22.97	41.2	8.9	59.39	49.7	9.0	35.36	67.2
9.3	49.38	51.1	9.5	29.14	43.5	9.7	23.62	41.2	9.9	59.43	49.4	9.9	35.12	66.9
10.3	48.47	51.2	10.5	29.22	43.8	10.7	24.29	41.3	10.9	59.46	49.1	10.9	34.83	66.6
11.3	47.50	51.2	11.5	29.30	44.1	11.7	24.99	41.3	11.9	59.49	48.8	11.9	34.53	66.2
12.2	46.50	51.3	12.5	29.39	44.4	12.7	25.71	41.3	12.9	59.54	48.4	12.9	34.23	65.9
13.2	45.45	51.4	13.5	29.47	44.8	13.7	26.48	41.3	13.9	59.59	48.1	13.9	33.98	65.6
14.2	44.33	51.5	14.5	29.53	45.1	14.7	27.27	41.3	14.9	59.67	47.7	14.9	33.78	65.2
15.2	43.16	51.6	15.5	29.56	45.5	15.7	28.06	41.4	15.9	59.77	47.4	15.9	33.67	64.8
16.2	41.97	51.6	16.5	29.55	45.9	16.7	28.85	41.5	16.9	59.90	47.0	16.9	33.66	64.4
17.2	40.79	51.6	17.5	29.52	46.2	17.7	29.62	41.6	17.9	60.06	46.6	17.9	33.73	64.1
18.2	39.63	51.6	18.5	29.46	46.6	18.7	30.35	41.7	18.9	60.23	46.3	18.9	33.88	63.7
19.2	38.51	51.6	19.5	29.37	46.9	19.7	31.03	41.8	19.9	60.41	46.0	19.9	34.06	63.4
20.2	37.46	51.6	20.5	29.28	47.2	20.7	31.68	41.9	20.9	60.59	45.7	20.9	34.25	63.1
21.2	36.46	51.5	21.5	29.19	47.5	21.7	32.29	42.0	21.9	60.75	45.4	21.9	34.45	62.7
22.2	35.49	51.5	22.5	29.11	47.8	22.7	32.89	42.1	22.9	60.91	45.1	22.9	34.63	62.4
23.2	34.54	51.5	23.5	29.04	48.1	23.7	33.49	42.2	23.9	61.06	44.9	23.9	34.76	62.1
24.2	33.59	51.5	24.4	28.98	48.4	24.7	34.10	42.3	24.9	61.20	44.6	24.9	34.86	61.8
25.2	32.61	51.5	25.4	28.93	48.7	25.7	34.75	42.4	25.9	61.34	44.3	25.9	34.96	61.5
26.2	31.58	51.4	26.4	28.89	49.0	26.7	35.43	42.5	26.9	61.48	44.0	26.9	35.06	61.2
27.2	30.50	51.4	27.4	28.83	49.3	27.7	36.13	42.6	27.9	61.65	43.6	27.9	35.20	60.9
28.2	29.37	51.4	28.4	28.74	49.7	28.7	36.86	42.7	28.9	61.84	43.3	28.9	35.39	60.5
29.2	28.20	51.4	29.4	28.64	50.0	29.7	37.58	42.9	29.9	62.05	43.0	29.9	35.66	60.2
30.2	27.03	51.3	30.4	28.50	50.4	30.6	38.28	43.0	30.9	62.27	42.6	30.9	36.02	59.8
31.2	25.87	51.2	31.4	28.32	50.7	31.6	38.96	43.2	31.9	62.52	42.3	31.9	36.46	59.4
32.2	24.77	51.1	32.4	28.13	51.0	32.6	39.60	43.4	32.9	62.78	42.0	32.9	36.94	59.1

**CIRCUMPOLAR STARS.**

**APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.**

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Feb.	h m 1 24	° +88 48	Feb.	h m 6 57	° +87 11	Feb.	h m 12 14	° +88 12	Feb.	h m 18 2	° +86 36	Feb.	h m 19 13	° +88 59
	s	"		s	"		s	"		s	"		s	"
1.2	84.77	51.1	1.4	28.13	51.0	1.6	39.60	43.4	1.9	2.78	42.0	1.9	36.94	59.1
2.2	83.71	51.0	2.4	27.94	51.3	2.6	40.18	43.6	2.9	3.03	41.8	2.9	37.45	58.8
3.2	82.73	50.9	3.4	27.73	51.6	3.6	40.72	43.8	3.9	3.28	41.6	3.9	37.97	58.5
4.2	81.79	50.8	4.4	27.54	51.9	4.6	41.23	44.0	4.9	3.53	41.3	4.9	38.46	58.2
5.2	80.90	50.7	5.4	27.35	52.2	5.6	41.73	44.2	5.9	3.75	41.1	5.9	38.91	58.0
6.2	80.04	50.6	6.4	27.18	52.4	6.6	42.24	44.4	6.9	3.96	40.9	6.9	39.32	57.7
7.2	79.16	50.5	7.4	27.04	52.7	7.6	42.77	44.6	7.9	4.18	40.7	7.9	39.69	57.4
8.2	78.24	50.4	8.4	26.89	52.9	8.6	43.31	44.8	8.9	4.39	40.4	8.9	40.06	57.1
9.2	77.29	50.3	9.4	26.73	53.2	9.6	43.89	44.9	9.9	4.61	40.1	9.9	40.45	56.8
10.2	76.29	50.2	10.4	26.56	53.5	10.6	44.50	45.1	10.9	4.84	39.8	10.9	40.89	56.5
11.2	75.24	50.1	11.4	26.38	53.8	11.6	45.11	45.3	11.9	5.10	39.6	11.9	41.40	56.2
12.2	74.18	50.0	12.4	26.16	54.1	12.6	45.71	45.5	12.9	5.39	39.3	12.9	42.00	55.8
13.2	73.10	49.8	13.4	25.90	54.5	13.6	46.29	45.8	13.9	5.70	39.0	13.9	42.68	55.5
14.2	72.06	49.7	14.4	25.63	54.8	14.6	46.83	46.1	14.9	6.03	38.8	14.9	43.45	55.2
15.2	71.08	49.5	15.4	25.33	55.0	15.6	47.32	46.4	15.8	6.36	38.6	15.9	44.27	54.9
16.2	70.15	49.3	16.4	25.01	55.3	16.6	47.77	46.6	16.8	6.70	38.4	16.9	45.11	54.6
17.2	69.29	49.1	17.4	24.70	55.5	17.6	48.18	46.9	17.8	7.03	38.3	17.9	45.94	54.4
18.2	68.49	48.9	18.4	24.39	55.7	18.6	48.55	47.2	18.8	7.33	38.1	18.9	46.74	54.1
19.1	67.72	48.7	19.4	24.10	55.9	19.6	48.91	47.4	19.8	7.63	37.9	19.9	47.51	53.9
20.1	66.99	48.5	20.4	23.82	56.2	20.6	49.27	47.6	20.8	7.92	37.8	20.9	48.22	53.7
21.1	66.23	48.3	21.4	23.55	56.4	21.6	49.66	47.8	21.8	8.20	37.6	21.9	48.90	53.5
22.1	65.44	48.2	22.4	23.29	56.6	22.6	50.07	48.1	22.8	8.49	37.4	22.9	49.59	53.2
23.1	64.61	48.0	23.4	23.03	56.8	23.6	50.51	48.3	23.8	8.79	37.2	23.9	50.31	53.0
24.1	63.74	47.8	24.4	22.75	57.1	24.6	50.97	48.5	24.8	9.10	37.0	24.9	51.09	52.7
25.1	62.84	47.6	25.4	22.44	57.3	25.6	51.43	48.8	25.8	9.44	36.8	25.9	51.93	52.4
26.1	61.92	47.4	26.4	22.13	57.6	26.6	51.87	49.1	26.8	9.79	36.6	26.9	52.83	52.1
27.1	61.03	47.2	27.4	21.76	57.8	27.6	52.29	49.4	27.8	10.15	36.5	27.9	53.81	51.9
28.1	60.18	46.9	28.4	21.39	58.0	28.6	52.66	49.7	28.8	10.53	36.3	28.9	54.83	51.6
29.1	59.39	46.7	29.3	21.01	58.3	29.6	52.97	50.0	29.8	10.91	36.2	29.9	55.88	51.4
30.1	58.67	46.4	30.3	20.61	58.4	30.6	53.24	50.4	30.8	11.28	36.1	30.9	56.93	51.2

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
Mar.	h m 1 24	° ' " +88 48	Mar.	h m 6 57	° ' " +87 11	Mar.	h m 12 14	° ' " +88 12	Mar.	h m 18 2	° ' " +86 36	Mar.	h m 19 13	° ' " +88 59
	s	"		s	"		s	"		s	"		s	"
1.1	59.39	46.7	1.3	21.01	58.3	1.6	52.97	50.0	1.8	10.91	36.2	1.9	55.88	51.4
2.1	58.67	46.4	2.3	20.61	58.4	2.6	53.24	50.4	2.8	11.28	36.1	2.9	56.93	51.2
3.1	58.03	46.1	3.3	20.22	58.6	3.6	53.47	50.7	3.8	11.64	36.0	3.9	57.98	51.0
4.1	57.44	45.9	4.3	19.85	58.7	4.6	53.68	51.0	4.8	11.99	35.9	4.9	58.97	50.9
5.1	56.90	45.6	5.3	19.50	58.9	5.6	53.88	51.2	5.8	12.31	35.9	5.9	59.91	50.7
6.1	56.36	45.4	6.3	19.16	59.0	6.6	54.09	51.5	6.8	12.61	35.8	6.8	60.80	50.6
7.1	55.80	45.2	7.3	18.84	59.2	7.6	54.31	51.8	7.8	12.92	35.7	7.8	61.66	50.4
8.1	55.22	45.0	8.3	18.53	59.3	8.6	54.57	52.1	8.8	13.22	35.6	8.8	62.52	50.2
9.1	54.60	44.7	9.3	18.21	59.5	9.5	54.85	52.3	9.8	13.54	35.5	9.8	63.42	50.0
10.1	53.94	44.5	10.3	17.87	59.7	10.5	55.13	52.6	10.8	13.89	35.4	10.8	64.36	49.8
11.1	53.25	44.3	11.3	17.50	59.9	11.5	55.41	52.9	11.8	14.25	35.2	11.8	65.38	49.6
12.1	52.57	44.0	12.3	17.11	60.0	12.5	55.68	53.3	12.8	14.63	35.1	12.8	66.49	49.4
13.1	51.91	43.7	13.3	16.70	60.2	13.5	55.91	53.6	13.8	15.02	35.1	13.8	67.65	49.2
14.1	51.29	43.4	14.3	16.25	60.4	14.5	56.09	54.0	14.8	15.42	35.0	14.8	68.87	49.1
15.1	50.75	43.1	15.3	15.79	60.5	15.5	56.22	54.3	15.8	15.82	35.0	15.8	70.12	48.9
16.1	50.28	42.8	16.3	15.34	60.6	16.5	56.29	54.7	16.8	16.23	35.0	16.8	71.36	48.8
17.1	49.88	42.5	17.3	14.91	60.7	17.5	56.33	55.0	17.8	16.61	35.0	17.8	72.57	48.7
18.1	49.54	42.2	18.3	14.48	60.7	18.5	56.36	55.3	18.8	16.97	35.0	18.8	73.74	48.6
19.1	49.22	41.9	19.3	14.07	60.8	19.5	56.38	55.6	19.8	17.31	35.0	19.8	74.85	48.5
20.1	48.91	41.6	20.3	13.68	60.8	20.5	56.41	55.9	20.8	17.65	35.0	20.8	75.92	48.4
21.1	48.58	41.3	21.3	13.31	60.9	21.5	56.46	56.2	21.8	17.98	35.0	21.8	76.95	48.3
22.1	48.22	41.0	22.3	12.95	61.0	22.5	56.54	56.4	22.8	18.31	34.9	22.8	77.99	48.2
23.1	47.82	40.8	23.3	12.56	61.1	23.5	56.64	56.7	23.7	18.66	34.9	23.8	79.06	48.1
24.1	47.39	40.5	24.3	12.16	61.2	24.5	56.75	57.0	24.7	19.02	34.9	24.8	80.18	48.0
25.1	46.96	40.2	25.3	11.75	61.3	25.5	56.84	57.4	25.7	19.40	34.9	25.8	81.34	47.9
26.0	46.53	39.9	26.3	11.32	61.4	26.5	56.91	57.7	26.7	19.79	34.9	26.8	82.58	47.8
27.0	46.14	39.6	27.3	10.85	61.5	27.5	56.94	58.0	27.7	20.19	34.9	27.8	83.87	47.7
28.0	45.81	39.2	28.3	10.39	61.5	28.5	56.92	58.4	28.7	20.59	34.9	28.8	85.17	47.6
29.0	45.55	38.9	29.3	9.93	61.6	29.5	56.85	58.7	29.7	20.98	35.0	29.8	86.49	47.5
30.0	45.37	38.5	30.3	9.45	61.6	30.5	56.74	59.1	30.7	21.35	35.1	30.8	87.78	47.5
31.0	45.27	38.2	31.3	9.00	61.6	31.5	56.59	59.4	31.7	21.71	35.1	31.8	89.01	47.5
32.0	45.21	37.9	32.3	8.57	61.6	32.5	56.43	59.7	32.7	22.04	35.2	32.8	90.18	47.5

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Apr.	h m 1 24	° ' 88 48	Apr.	h m 6 56	° ' 87 11	Apr.	h m 12 14	° ' 88 12	Apr.	h m 18 2	° ' 86 36	Apr.	h m 19 14	° ' 88 59
	°	"		°	"		°	"		°	"		°	"
1.0	45.21	37.9	1.3	68.57	61.6	1.5	56.43	59.7	1.7	22.04	35.2	1.8	30.18	47.5
2.0	45.19	37.6	2.3	68.17	61.5	2.5	56.27	60.0	2.7	22.36	35.3	2.8	31.29	47.5
3.0	45.16	37.3	3.3	67.79	61.5	3.5	56.12	60.3	3.7	22.66	35.4	3.8	32.36	47.5
4.0	45.11	37.0	4.3	67.42	61.5	4.5	56.00	60.6	4.7	22.96	35.5	4.8	33.39	47.5
5.0	45.02	36.8	5.3	67.06	61.5	5.5	55.90	60.8	5.7	23.27	35.6	5.8	34.44	47.5
6.0	44.89	36.5	6.3	66.69	61.5	6.5	55.83	61.1	6.7	23.59	35.6	6.8	35.52	47.4
7.0	44.74	36.2	7.2	66.30	61.5	7.5	55.75	61.4	7.7	23.92	35.7	7.8	36.65	47.4
8.0	44.58	35.9	8.2	65.89	61.6	8.5	55.66	61.8	8.7	24.27	35.7	8.8	37.85	47.4
9.0	44.43	35.6	9.2	65.45	61.6	9.5	55.55	62.1	9.7	24.64	35.8	9.8	39.11	47.3
10.0	44.32	35.3	10.2	65.00	61.6	10.5	55.40	62.4	10.7	25.02	35.9	10.8	40.41	47.3
11.0	44.29	34.9	11.2	64.53	61.5	11.5	55.18	62.8	11.7	25.39	36.0	11.7	41.74	47.3
12.0	44.32	34.6	12.2	64.06	61.5	12.5	54.92	63.1	12.7	25.75	36.2	12.7	43.05	47.4
13.0	44.43	34.2	13.2	63.61	61.4	13.5	54.62	63.4	13.7	26.10	36.4	13.7	44.34	47.4
13.9	44.59	33.9	14.2	63.17	61.3	14.5	54.29	63.7	14.7	26.42	36.5	14.7	45.58	47.5
14.9	44.80	33.6	15.2	62.76	61.2	15.4	53.96	64.0	15.7	26.73	36.7	15.7	46.75	47.6
15.9	45.03	33.3	16.2	62.38	61.1	16.4	53.64	64.2	16.7	27.02	36.9	16.7	47.86	47.7
16.9	45.24	33.0	17.2	62.00	61.0	17.4	53.34	64.4	17.7	27.30	37.0	17.7	48.92	47.8
17.9	45.44	32.7	18.2	61.64	60.9	18.4	53.05	64.7	18.7	27.58	37.2	18.7	49.95	47.8
18.9	45.59	32.4	19.2	61.29	60.8	19.4	52.80	64.9	19.7	27.85	37.3	19.7	51.00	47.9
19.9	45.71	32.2	20.2	60.93	60.8	20.4	52.57	65.2	20.7	28.14	37.5	20.7	52.07	48.0
20.9	45.81	31.9	21.2	60.56	60.7	21.4	52.33	65.4	21.7	28.44	37.6	21.7	53.18	48.0
21.9	45.89	31.6	22.2	60.17	60.7	22.4	52.07	65.7	22.7	28.76	37.7	22.7	54.35	48.1
22.9	46.01	31.3	23.2	59.76	60.6	23.4	51.79	66.0	23.7	29.08	37.9	23.7	55.57	48.1
23.9	46.20	31.0	24.2	59.33	60.5	24.4	51.47	66.3	24.7	29.40	38.1	24.7	56.81	48.2
24.9	46.45	30.7	25.2	58.90	60.4	25.4	51.08	66.6	25.7	29.72	38.3	25.7	58.04	48.3
25.9	46.77	30.3	26.2	58.49	60.2	26.4	50.65	66.9	26.7	30.02	38.5	26.7	59.25	48.4
26.9	47.18	30.0	27.2	58.09	60.1	27.4	50.19	67.1	27.7	30.30	38.7	27.7	60.41	48.6
27.9	47.63	29.7	28.2	57.72	59.9	28.4	49.72	67.4	28.7	30.55	39.0	28.7	61.49	48.7
28.9	48.11	29.4	29.2	57.37	59.7	29.4	49.24	67.6	29.6	30.78	39.2	29.7	62.49	48.9
29.9	48.62	29.1	30.2	57.05	59.6	30.4	48.78	67.8	30.6	30.99	39.4	30.7	63.43	49.0
30.9	49.10	28.9	31.2	56.75	59.4	31.4	48.34	68.0	31.6	31.20	39.7	31.7	64.31	49.2
31.9	49.54	28.7	32.2	56.46	59.2	32.4	47.93	68.2	32.6	31.41	39.9	32.7	65.18	49.3

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>a</i> Ursæ Min. ( <i>Polaris</i> ).		Mean Solar Date.	51 Cephei ( <i>Hæv.</i> ).		Mean Solar Date.	6 Ursæ Min. ( <i>B.</i> ).		Mean Solar Date.	<i>δ</i> Ursæ Min.		Mean Solar Date.	<i>λ</i> Ursæ Min.	
	Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .
May	h m	° '	May	h m	° '	May	h m	° '	May	h m	° '	May	h m	° '
	1 24	+88 48		6 56	+87 11		12 14	+88 13		18 2	+86 36		19 15	+88 59
	s	"		s	"		s	"		s	"		s	"
1.9	49.54	28.7	1.2	56.75	59.4	1.4	48.34	8.0	1.6	31.20	39.7	1.7	4.31	49.2
2.9	49.95	28.5	2.2	56.46	59.2	2.4	47.93	8.2	2.6	31.41	39.9	2.7	5.18	49.3
3.9	50.32	28.2	3.2	56.17	59.1	3.4	47.55	8.4	3.6	31.61	40.1	3.7	6.07	49.5
4.9	50.67	28.0	4.2	55.87	59.0	4.4	47.18	8.6	4.6	31.83	40.3	4.7	6.98	49.6
5.9	51.03	27.7	5.2	55.56	58.8	5.4	46.80	8.8	5.6	32.07	40.5	5.7	7.95	49.7
6.9	51.41	27.4	6.2	55.22	58.7	6.4	46.40	9.1	6.6	32.33	40.7	6.7	8.97	49.8
7.9	51.85	27.1	7.2	54.87	58.5	7.4	45.98	9.3	7.6	32.58	40.9	7.7	10.03	50.0
8.9	52.35	26.9	8.2	54.51	58.4	8.4	45.52	9.6	8.6	32.84	41.1	8.7	11.12	50.1
9.9	52.93	26.6	9.2	54.15	58.2	9.4	45.00	9.8	9.6	33.10	41.4	9.7	12.22	50.3
10.9	53.56	26.3	10.2	53.79	58.0	10.4	44.44	10.0	10.6	33.33	41.7	10.7	13.27	50.5
11.9	54.25	26.0	11.2	53.46	57.8	11.4	43.85	10.2	11.6	33.54	42.0	11.7	14.26	50.7
12.9	54.96	25.8	12.2	53.15	57.5	12.4	43.26	10.4	12.6	33.72	42.3	12.7	15.19	51.0
13.9	55.66	25.6	13.1	52.87	57.3	13.4	42.66	10.5	13.6	33.89	42.6	13.7	16.04	51.2
14.9	56.34	25.4	14.1	52.61	57.0	14.4	42.09	10.7	14.6	34.04	42.9	14.7	16.82	51.4
15.9	56.98	25.2	15.1	52.37	56.8	15.4	41.56	10.8	15.6	34.18	43.1	15.7	17.56	51.6
16.9	57.58	25.0	16.1	52.14	56.6	16.4	41.05	10.9	16.6	34.33	43.4	16.7	18.28	51.8
17.9	58.14	24.8	17.1	51.92	56.4	17.4	40.56	11.0	17.6	34.48	43.6	17.7	19.02	52.0
18.9	58.69	24.6	18.1	51.68	56.2	18.4	40.09	11.1	18.6	34.64	43.9	18.7	19.78	52.2
19.9	59.24	24.3	19.1	51.43	56.0	19.4	39.61	11.3	19.6	34.82	44.1	19.6	20.59	52.4
20.9	59.84	24.1	20.1	51.17	55.8	20.4	39.11	11.5	20.6	35.00	44.3	20.6	21.45	52.6
21.9	60.50	23.9	21.1	50.89	55.6	21.3	38.58	11.6	21.6	35.18	44.6	21.6	22.33	52.8
22.9	61.23	23.6	22.1	50.61	55.4	22.3	38.00	11.8	22.6	35.35	44.9	22.6	23.21	53.0
23.9	62.02	23.4	23.1	50.34	55.1	23.3	37.38	12.0	23.6	35.51	45.2	23.6	24.06	53.3
24.9	62.87	23.2	24.1	50.08	54.9	24.3	36.73	12.1	24.6	35.65	45.6	24.6	24.87	53.5
25.9	63.76	23.0	25.1	49.85	54.6	25.3	36.05	12.2	25.6	35.76	45.9	25.6	25.60	53.8
26.9	64.68	22.8	26.1	49.65	54.3	26.3	35.37	12.3	26.6	35.85	46.2	26.6	26.24	54.1
27.9	65.56	22.7	27.1	49.48	54.0	27.3	34.71	12.4	27.6	35.91	46.5	27.6	26.79	54.4
28.9	66.42	22.6	28.1	49.33	53.7	28.3	34.07	12.5	28.6	35.96	46.8	28.6	27.29	54.7
29.9	67.24	22.4	29.1	49.21	53.4	29.3	33.46	12.6	29.6	36.01	47.1	29.6	27.74	54.9
30.9	68.00	22.3	30.1	49.09	53.2	30.3	32.90	12.6	30.6	36.05	47.4	30.6	28.20	55.2
31.9	68.74	22.2	31.1	48.97	53.0	31.3	32.35	12.7	31.6	36.10	47.7	31.6	28.67	55.4
32.9	69.44	22.0	32.1	48.83	52.7	32.3	31.81	12.8	32.6	36.17	47.9	32.6	29.18	55.6

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
June	h m 1 25	° ' 48 48	June	h m 6 56	° ' 87 11	June	h m 12 14	° ' 88 13	June	h m 18 2	° ' 86 36	June	h m 19 15	° ' 88 59
	s	"		s	"		s	"		s	"		s	"
1.9	9.44	22.0	1.1	48.83	52.7	1.3	31.81	12.8	1.6	36.17	47.9	1.6	29.18	55.6
2.9	10.19	21.9	2.1	48.68	52.5	2.3	31.27	12.9	2.6	36.24	48.2	2.6	29.73	55.9
3.9	10.97	21.7	3.1	48.51	52.3	3.3	30.70	13.0	3.6	36.34	48.5	3.6	30.33	56.1
4.9	11.79	21.5	4.1	48.34	52.0	4.3	30.10	13.0	4.6	36.43	48.8	4.6	30.94	56.4
5.9	12.69	21.4	5.1	48.16	51.7	5.3	29.45	13.1	5.5	36.52	49.1	5.6	31.56	56.6
6.9	13.65	21.2	6.1	47.99	51.4	6.3	28.77	13.2	6.5	36.59	49.5	6.6	32.15	56.9
7.8	14.65	21.1	7.1	47.83	51.1	7.3	28.05	13.3	7.5	36.63	49.8	7.6	32.71	57.2
8.8	15.68	20.9	8.1	47.70	50.8	8.3	27.33	13.3	8.5	36.66	50.2	8.6	33.18	57.6
9.8	16.71	20.8	9.1	47.60	50.5	9.3	26.61	13.3	9.5	36.67	50.5	9.6	33.58	57.9
10.8	17.71	20.7	10.1	47.52	50.2	10.3	25.91	13.3	10.5	36.65	50.8	10.6	33.90	58.2
11.8	18.67	20.7	11.1	47.46	49.9	11.3	25.24	13.3	11.5	36.63	51.2	11.6	34.16	58.5
12.8	19.58	20.6	12.1	47.43	49.6	12.3	24.62	13.3	12.5	36.60	51.5	12.6	34.38	58.8
13.8	20.45	20.6	13.1	47.40	49.3	13.3	24.02	13.2	13.5	36.58	51.8	13.6	34.60	59.1
14.8	21.28	20.5	14.1	47.35	49.0	14.3	23.44	13.2	14.5	36.55	52.0	14.6	34.84	59.4
15.8	22.11	20.4	15.1	47.30	48.8	15.3	22.87	13.2	15.5	36.54	52.3	15.6	35.11	59.7
16.8	22.95	20.3	16.1	47.24	48.5	16.3	22.29	13.2	16.5	36.54	52.6	16.6	35.42	59.9
17.8	23.84	20.2	17.1	47.17	48.2	17.3	21.70	13.2	17.5	36.55	52.9	17.6	35.76	60.2
18.8	24.79	20.1	18.0	47.09	48.0	18.3	21.07	13.2	18.5	36.55	53.2	18.6	36.12	60.5
19.8	25.80	20.0	19.0	47.01	47.7	19.3	20.39	13.2	19.5	36.55	53.5	19.6	36.46	60.8
20.8	26.87	19.9	20.0	46.95	47.3	20.3	19.69	13.2	20.5	36.52	53.8	20.6	36.75	61.1
21.8	27.99	19.9	21.0	46.91	47.0	21.3	18.96	13.2	21.5	36.46	54.2	21.6	36.97	61.5
22.8	29.11	19.8	22.0	46.89	46.7	22.3	18.22	13.2	22.5	36.38	54.6	22.6	37.11	61.8
23.8	30.23	19.8	23.0	46.91	46.3	23.3	17.50	13.1	23.5	36.28	54.9	23.5	37.15	62.2
24.8	31.31	19.8	24.0	46.97	46.0	24.3	16.82	13.0	24.5	36.17	55.2	24.5	37.11	62.5
25.8	32.34	19.9	25.0	47.04	45.7	25.3	16.16	12.9	25.5	36.04	55.5	25.5	37.03	62.8
26.8	33.32	19.9	26.0	47.12	45.4	26.3	15.54	12.8	26.5	35.90	55.8	26.5	36.92	63.1
27.8	34.25	19.9	27.0	47.20	45.1	27.2	14.97	12.7	27.5	35.78	56.1	27.5	36.82	63.4
28.8	35.14	19.9	28.0	47.28	44.8	28.2	14.41	12.7	28.5	35.66	56.4	28.5	36.74	63.7
29.8	36.03	19.9	29.0	47.35	44.5	29.2	13.85	12.6	29.5	35.56	56.6	29.5	36.72	64.0
30.8	36.97	19.9	30.0	47.39	44.3	30.2	13.28	12.5	30.5	35.46	56.9	30.5	36.73	64.3
31.8	37.94	19.8	31.0	47.43	44.0	31.2	12.68	12.5	31.5	35.38	57.2	31.5	36.78	64.6

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
July	h m 1 25	° +88 48	July	h m 6 56	° +87 11	July	h m 12 13	° +88 13	July	h m 18 2	° +86 36	July	h m 19 15	° +89 0
	s	"		s	"		s	"		s	"		s	"
1.8	37.94	19.8	1.0	47.43	44.0	1.2	72.68	12.5	1.5	35.38	57.2	1.5	36.78	4.6
2.8	38.95	19.8	2.0	47.46	43.7	2.2	72.05	12.4	2.5	35.29	57.5	2.5	36.83	4.9
3.8	40.03	19.8	3.0	47.49	43.4	3.2	71.39	12.3	3.5	35.20	57.8	3.5	36.87	5.2
4.8	41.15	19.8	4.0	47.53	43.0	4.2	70.70	12.2	4.5	35.09	58.2	4.5	36.86	5.5
5.8	42.29	19.8	5.0	47.60	42.7	5.2	69.99	12.1	5.5	34.96	58.5	5.5	36.79	5.9
6.8	43.45	19.9	6.0	47.69	42.3	6.2	69.28	12.0	6.5	34.80	58.8	6.5	36.65	6.3
7.8	44.58	19.9	6.9	47.82	42.0	7.2	68.59	11.8	7.5	34.62	59.1	7.5	36.42	6.6
8.8	45.67	20.0	7.9	47.97	41.7	8.2	67.94	11.7	8.5	34.42	59.4	8.5	36.11	7.0
9.8	46.71	20.1	8.9	48.13	41.4	9.2	67.32	11.5	9.5	34.22	59.7	9.5	35.76	7.3
10.8	47.68	20.2	9.9	48.31	41.1	10.2	66.75	11.3	10.5	34.02	60.0	10.5	35.41	7.6
11.8	48.60	20.2	10.9	48.48	40.8	11.2	66.21	11.1	11.5	33.83	60.3	11.5	35.06	7.9
12.8	49.50	20.3	11.9	48.64	40.5	12.2	65.69	11.0	12.4	33.66	60.5	12.5	34.74	8.2
13.8	50.40	20.4	12.9	48.79	40.3	13.2	65.17	10.8	13.4	33.50	60.7	13.5	34.46	8.5
14.8	51.34	20.4	13.9	48.93	40.0	14.2	64.64	10.7	14.4	33.34	61.0	14.5	34.23	8.7
15.7	52.32	20.5	14.9	49.06	39.7	15.2	64.08	10.5	15.4	33.18	61.3	15.5	34.02	9.0
16.7	53.35	20.5	15.9	49.17	39.4	16.2	63.48	10.4	16.4	33.01	61.5	16.5	33.79	9.3
17.7	54.44	20.6	16.9	49.30	39.1	17.2	62.86	10.3	17.4	32.83	61.8	17.5	33.52	9.7
18.7	55.57	20.6	17.9	49.46	38.8	18.2	62.21	10.1	18.4	32.63	62.1	18.5	33.19	10.0
19.7	56.72	20.7	18.9	49.64	38.4	19.2	61.56	9.9	19.4	32.40	62.4	19.5	32.79	10.4
20.7	57.86	20.9	19.9	49.84	38.1	20.2	60.91	9.7	20.4	32.15	62.7	20.5	32.31	10.7
21.7	58.97	21.0	20.9	50.08	37.8	21.2	60.29	9.5	21.4	31.87	63.0	21.5	31.73	11.1
22.7	60.04	21.2	21.9	50.35	37.5	22.2	59.70	9.3	22.4	31.58	63.3	22.5	31.09	11.4
23.7	61.04	21.4	22.9	50.64	37.2	23.2	59.17	9.0	23.4	31.29	63.6	23.5	30.42	11.7
24.7	61.99	21.5	23.9	50.93	36.9	24.2	58.68	8.8	24.4	31.00	63.8	24.5	29.75	12.0
25.7	62.90	21.7	24.9	51.20	36.6	25.2	58.21	8.6	25.4	30.72	64.0	25.5	29.10	12.3
26.7	63.78	21.8	25.9	51.47	36.4	26.2	57.76	8.4	26.4	30.46	64.2	26.5	28.48	12.6
27.7	64.66	22.0	26.9	51.72	36.1	27.2	57.31	8.2	27.4	30.21	64.4	27.5	27.92	12.8
28.7	65.57	22.1	27.9	51.96	35.9	28.2	56.84	8.0	28.4	29.97	64.6	28.5	27.39	13.1
29.7	66.53	22.2	28.9	52.17	35.6	29.2	56.34	7.8	29.4	29.74	64.9	29.5	26.88	13.4
30.7	67.53	22.3	29.9	52.40	35.4	30.2	55.81	7.5	30.4	29.50	65.1	30.5	26.37	13.7
31.7	68.59	22.5	30.9	52.64	35.1	31.2	55.24	7.3	31.4	29.25	65.4	31.4	25.83	14.0
32.7	69.67	22.6	31.9	52.87	34.8	32.1	54.67	7.1	32.4	28.98	65.6	32.4	25.23	14.3



CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hæv.).			6 Ursæ Min. (B.).			δ Ursæ Min.			λ Ursæ Min.		
Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.
Aug.	h m	°	Aug.	h m	°	Aug.	h m	°	Aug.	h m	°	Aug.	h m	°
	1 26	+88 48		6 56	+87 11		12 13	+88 12		18 2	+86 37		19 14	+89 0
	s	"		s	"		s	"		s	"		s	"
1.7	9.67	22.6	1.9	53.15	34.5	1.1	54.67	67.1	1.4	28.98	5.6	1.4	85.23	14.3
2.7	10.76	22.8	2.9	53.45	34.1	2.1	54.09	66.9	2.4	28.68	5.9	2.4	84.56	14.6
3.7	11.83	23.0	3.9	53.77	33.8	3.1	53.52	66.6	3.4	28.36	6.2	3.4	83.82	15.0
4.7	12.86	23.2	4.9	54.11	33.6	4.1	53.00	66.3	4.4	28.03	6.4	4.4	83.00	15.3
5.7	13.83	23.4	5.9	54.47	33.3	5.1	52.51	66.0	5.4	27.69	6.6	5.4	82.12	15.6
6.7	14.73	23.7	6.9	54.83	33.1	6.1	52.07	65.7	6.4	27.34	6.8	6.4	81.22	15.9
7.7	15.58	23.9	7.9	55.17	32.8	7.1	51.67	65.4	7.4	27.02	7.0	7.4	80.33	16.1
8.7	16.39	24.1	8.9	55.50	32.6	8.1	51.30	65.1	8.4	26.70	7.2	8.4	79.47	16.4
9.7	17.19	24.3	9.9	55.82	32.4	9.1	50.94	64.8	9.4	26.39	7.3	9.4	78.64	16.6
10.7	17.99	24.5	10.9	56.12	32.2	10.1	50.57	64.5	10.4	26.10	7.5	10.4	77.86	16.9
11.7	18.83	24.7	11.9	56.42	32.0	11.1	50.19	64.2	11.4	25.81	7.7	11.4	77.12	17.1
12.7	19.71	24.8	12.9	56.72	31.7	12.1	49.77	64.0	12.4	25.51	7.9	12.4	76.38	17.4
13.7	20.65	25.0	13.9	57.03	31.4	13.1	49.33	63.7	13.4	25.20	8.1	13.4	75.62	17.6
14.7	21.63	25.2	14.9	57.37	31.2	14.1	48.87	63.5	14.4	24.87	8.3	14.4	74.80	17.9
15.7	22.64	25.4	15.9	57.74	30.9	15.1	48.38	63.2	15.4	24.53	8.5	15.4	73.92	18.2
16.7	23.64	25.7	16.9	58.15	30.6	16.1	47.91	62.9	16.4	24.16	8.7	16.4	72.96	18.5
17.7	24.62	26.0	17.9	58.58	30.4	17.1	47.46	62.5	17.3	23.78	8.9	17.4	71.92	18.8
18.7	25.55	26.2	18.9	59.02	30.1	18.1	47.05	62.2	18.3	23.37	9.1	18.4	70.81	19.1
19.6	26.42	26.5	19.9	59.47	29.9	19.1	46.69	61.8	19.3	22.96	9.2	19.4	69.65	19.4
20.6	27.21	26.8	20.9	59.92	29.7	20.1	46.36	61.5	20.3	22.56	9.4	20.4	68.49	19.6
21.6	27.94	27.1	21.9	60.35	29.5	21.1	46.08	61.2	21.3	22.16	9.5	21.4	67.34	19.8
22.6	28.63	27.4	22.9	60.76	29.4	22.1	45.82	60.8	22.3	21.78	9.6	22.4	66.23	20.0
23.6	29.33	27.7	23.9	61.16	29.2	23.1	45.57	60.5	23.3	21.41	9.7	23.4	65.16	20.2
24.6	30.04	27.9	24.9	61.54	29.0	24.1	45.32	60.2	24.3	21.06	9.8	24.4	64.15	20.4
25.6	30.78	28.2	25.9	61.92	28.8	25.1	45.05	59.9	25.3	20.72	9.9	25.4	63.16	20.6
26.6	31.56	28.4	26.9	62.29	28.6	26.1	44.74	59.6	26.3	20.38	10.1	26.4	62.19	20.9
27.6	32.39	28.7	27.9	62.67	28.4	27.1	44.40	59.3	27.3	20.02	10.2	27.4	61.21	21.1
28.6	33.24	28.9	28.9	63.08	28.2	28.1	44.04	59.0	28.3	19.65	10.4	28.4	60.19	21.3
29.6	34.11	29.2	29.9	63.52	27.9	29.1	43.67	58.7	29.3	19.27	10.5	29.4	59.11	21.6
30.6	34.99	29.5	30.8	63.98	27.7	30.1	43.32	58.3	30.3	18.86	10.7	30.4	57.95	21.9
31.6	35.81	29.8	31.8	64.44	27.5	31.1	43.00	57.9	31.3	18.44	10.8	31.4	56.72	22.1
32.6	36.57	30.1	32.8	64.93	27.3	32.1	42.73	57.5	32.3	18.00	10.9	32.4	55.44	22.3

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>a</i> Ursæ Min. ( <i>Polaris</i> ).		Mean Solar Date.	51 Cephei (HEV.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	<i>δ</i> Ursæ Min.		Mean Solar Date.	<i>λ</i> Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '
	1 26	+88 48		6 57	+87 11		12 13	+88 12		18 2	+86 37		19 14	+89 0
	s	"		s	"		s	"		s	"		s	"
1.6	36.57	30.1	1.8	4.93	27.3	1.1	42.73	57.5	1.3	18.00	10.9	1.4	55.44	22.3
2.6	37.26	30.5	2.8	5.43	27.1	2.1	42.49	57.1	2.3	17.57	11.0	2.4	54.13	22.5
3.6	37.88	30.8	3.8	5.92	27.0	3.1	42.31	56.8	3.3	17.15	11.1	3.4	52.83	22.7
4.6	38.46	31.2	4.8	6.39	26.9	4.1	42.17	56.4	4.3	16.73	11.1	4.4	51.54	22.9
5.6	38.99	31.5	5.8	6.84	26.7	5.1	42.03	56.0	5.3	16.33	11.2	5.3	50.29	23.1
6.6	39.53	31.8	6.8	7.28	26.6	6.0	41.89	55.6	6.3	15.95	11.2	6.3	49.10	23.2
7.6	40.09	32.0	7.8	7.70	26.5	7.0	41.75	55.3	7.3	15.58	11.3	7.3	47.95	23.4
8.6	40.69	32.3	8.8	8.11	26.3	8.0	41.59	55.0	8.3	15.21	11.4	8.3	46.82	23.5
9.6	41.34	32.6	9.8	8.54	26.2	9.0	41.39	54.6	9.3	14.84	11.4	9.3	45.70	23.7
10.6	42.04	32.9	10.8	9.00	26.0	10.0	41.17	54.3	10.3	14.45	11.5	10.3	44.53	23.9
11.6	42.75	33.2	11.8	9.47	25.8	11.0	40.93	54.0	11.3	14.04	11.6	11.3	43.30	24.1
12.6	43.47	33.6	12.8	9.97	25.6	12.0	40.70	53.6	12.3	13.60	11.7	12.3	42.01	24.3
13.6	44.17	33.9	13.8	10.50	25.5	13.0	40.48	53.2	13.3	13.15	11.8	13.3	40.63	24.5
14.6	44.82	34.3	14.8	11.04	25.3	14.0	40.30	52.8	14.3	12.69	11.9	14.3	39.19	24.7
15.6	45.41	34.7	15.8	11.59	25.2	15.0	40.16	52.4	15.3	12.22	11.9	15.3	37.70	24.9
16.6	45.92	35.0	16.8	12.14	25.1	16.0	40.08	52.0	16.3	11.75	11.9	16.3	36.20	25.0
17.6	46.38	35.4	17.8	12.68	25.0	17.0	40.05	51.6	17.3	11.29	11.9	17.3	34.72	25.1
18.6	46.79	35.8	18.8	13.20	24.9	18.0	40.04	51.2	18.3	10.85	11.9	18.3	33.26	25.2
19.6	47.16	36.2	19.8	13.71	24.9	19.0	40.04	50.8	19.3	10.43	11.9	19.3	31.85	25.3
20.6	47.54	36.5	20.8	14.19	24.8	20.0	40.04	50.5	20.3	10.02	11.8	20.3	30.50	25.4
21.6	47.95	36.8	21.8	14.65	24.7	21.0	40.03	50.1	21.3	9.62	11.8	21.3	29.20	25.5
22.6	48.38	37.1	22.8	15.12	24.6	22.0	40.01	49.8	22.3	9.23	11.8	22.3	27.94	25.6
23.6	48.86	37.5	23.8	15.59	24.5	23.0	39.95	49.4	23.2	8.84	11.9	23.3	26.68	25.8
24.6	49.37	37.8	24.8	16.07	24.4	24.0	39.87	49.1	24.2	8.43	11.9	24.3	25.39	25.9
25.5	49.91	38.1	25.8	16.58	24.3	25.0	39.77	48.7	25.2	8.01	11.9	25.3	24.05	26.0
26.5	50.43	38.5	26.8	17.11	24.2	25.9	39.68	48.3	26.2	7.59	12.0	26.3	22.65	26.2
27.5	50.91	38.9	27.8	17.66	24.1	26.9	39.60	47.9	27.2	7.14	12.0	27.3	21.19	26.3
28.5	51.34	39.3	28.8	18.21	24.0	27.9	39.57	47.5	28.2	6.67	12.0	28.3	19.67	26.4
29.5	51.71	39.7	29.8	18.77	23.9	28.9	39.60	47.1	29.2	6.20	11.9	29.3	18.11	26.5
30.5	52.00	40.1	30.8	19.33	23.9	29.9	39.67	46.6	30.2	5.75	11.9	30.3	16.55	26.6
31.5	52.23	40.5	31.8	19.88	23.9	30.9	39.78	46.2	31.2	5.31	11.8	31.3	15.03	26.7
32.5	52.41	40.9	32.8	20.41	23.9	31.9	39.92	45.8	32.2	4.88	11.7	32.3	13.56	26.7

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>a</i> Ursæ Min. ( <i>Polaris</i> ).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	<i>δ</i> Ursæ Min.		Mean Solar Date.	<i>λ</i> Ursæ Min.	
	Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .
Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '
	1 26	+88 48		6 57	+87 11		12 13	+88 12		18 1	+86 37		19 13	+89 0
	s	"		s	"		s	"		s	"		s	"
1.5	52.23	40.5	1.8	19.88	23.9	1.9	39.92	45.8	1.2	65.31	11.8	1.3	75.03	26.7
2.5	52.41	40.9	2.8	20.41	23.9	2.9	40.07	45.4	2.2	64.88	11.7	2.3	73.56	26.7
3.5	52.58	41.2	3.8	20.91	23.9	3.9	40.22	45.1	3.2	64.48	11.6	3.3	72.13	26.7
4.5	52.75	41.6	4.8	21.40	23.8	4.9	40.36	44.7	4.2	64.10	11.5	4.3	70.75	26.8
5.5	52.96	41.9	5.8	21.88	23.8	5.9	40.45	44.4	5.2	63.72	11.5	5.3	69.41	26.8
6.5	53.22	42.3	6.8	22.34	23.8	6.9	40.51	44.0	6.2	63.33	11.4	6.3	68.10	26.8
7.5	53.51	42.6	7.7	22.83	23.8	7.9	40.56	43.7	7.2	62.93	11.4	7.3	66.76	26.9
8.5	53.82	43.0	8.7	23.35	23.7	8.9	40.61	43.3	8.2	62.53	11.3	8.3	65.39	27.0
9.5	54.17	43.3	9.7	23.88	23.7	9.9	40.67	42.9	9.2	62.11	11.3	9.3	63.96	27.1
10.5	54.49	43.7	10.7	24.43	23.6	10.9	40.76	42.5	10.2	61.67	11.2	10.3	62.47	27.1
11.5	54.75	44.1	11.7	25.00	23.6	11.9	40.89	42.1	11.2	61.21	11.2	11.3	60.90	27.2
12.5	54.97	44.5	12.7	25.59	23.6	12.9	41.06	41.7	12.2	60.74	11.1	12.3	59.27	27.2
13.5	55.12	45.0	13.7	26.18	23.6	13.9	41.29	41.3	13.2	60.27	11.0	13.2	57.62	27.3
14.5	55.19	45.4	14.7	26.76	23.6	14.9	41.55	40.9	14.2	59.82	10.8	14.2	56.00	27.3
15.5	55.21	45.8	15.7	27.31	23.7	15.9	41.83	40.5	15.2	59.39	10.7	15.2	54.40	27.3
16.5	55.18	46.2	16.7	27.85	23.7	16.9	42.12	40.1	16.2	58.97	10.5	16.2	52.86	27.2
17.5	55.15	46.6	17.7	28.36	23.8	17.9	42.40	39.8	17.2	58.58	10.4	17.2	51.39	27.2
18.5	55.13	47.0	18.7	28.85	23.8	18.9	42.66	39.5	18.2	58.20	10.2	18.2	49.99	27.2
19.5	55.13	47.3	19.7	29.32	23.9	19.9	42.89	39.1	19.2	57.84	10.1	19.2	48.62	27.1
20.5	55.18	47.6	20.7	29.81	23.9	20.9	43.10	38.8	20.2	57.48	10.0	20.2	47.28	27.1
21.5	55.27	48.0	21.7	30.30	23.9	21.9	43.29	38.5	21.2	57.11	9.9	21.2	45.93	27.1
22.5	55.38	48.3	22.7	30.80	23.9	22.9	43.49	38.1	22.2	56.72	9.8	22.2	44.56	27.1
23.5	55.47	48.7	23.7	31.32	24.0	23.9	43.70	37.7	23.2	56.32	9.6	23.2	43.13	27.1
24.5	55.55	49.1	24.7	31.86	24.0	24.9	43.94	37.3	24.2	55.91	9.5	24.2	41.65	27.1
25.5	55.57	49.5	25.7	32.42	24.0	25.9	44.22	36.9	25.2	55.49	9.4	25.2	40.12	27.1
26.5	55.54	49.9	26.7	32.99	24.1	26.9	44.55	36.5	26.2	55.07	9.2	26.2	38.55	27.1
27.5	55.42	50.3	27.7	33.54	24.2	27.9	44.93	36.1	27.2	54.66	9.0	27.2	36.97	27.0
28.5	55.23	50.7	28.7	34.08	24.3	28.9	45.35	35.7	28.2	54.25	8.8	28.2	35.42	27.0
29.5	55.00	51.1	29.7	34.60	24.4	29.9	45.78	35.4	29.1	53.87	8.6	29.2	33.91	26.9
30.5	54.72	51.5	30.7	35.10	24.6	30.9	46.20	35.0	30.1	53.51	8.4	30.2	32.46	26.8
31.5	54.44	51.9	31.7	35.57	24.7	31.9	46.62	34.7	31.1	53.17	8.2	31.2	31.08	26.7
32.4	54.19	52.2	32.7	36.03	24.8	32.9	47.01	34.4	32.1	52.85	8.0	32.2	29.76	26.6

## CIRCUMPOLAR STARS.

### APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (HEV.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Nov.	h m 1 26	° +88 48	Nov.	h m 6 57	° +87 11	Nov.	h m 12 13	° +88 12	Nov.	h m 18 1	° +86 37	Nov.	h m 19 12	° +89 0
	s	"		s	"		s	"		s	"		s	"
1.4	54.19	52.2	1.7	36.03	24.8	1.9	47.01	34.4	1.1	52.85	8.0	1.2	89.76	26.6
2.4	53.97	52.6	2.7	36.47	24.9	2.9	47.36	34.1	2.1	52.54	7.8	2.2	88.48	26.5
3.4	53.80	52.9	3.7	36.92	25.0	3.9	47.71	33.8	3.1	52.22	7.6	3.2	87.21	26.4
4.4	53.66	53.2	4.7	37.40	25.1	4.9	48.03	33.5	4.1	51.88	7.4	4.2	85.92	26.3
5.4	53.54	53.6	5.7	37.89	25.1	5.9	48.37	33.2	5.1	51.54	7.3	5.2	84.58	26.2
6.4	53.42	54.0	6.7	38.39	25.2	6.9	48.73	32.8	6.1	51.18	7.1	6.2	83.19	26.2
7.4	53.26	54.4	7.7	38.92	25.3	7.9	49.12	32.5	7.1	50.80	6.9	7.2	81.73	26.1
8.4	53.05	54.8	8.7	39.46	25.4	8.9	49.55	32.1	8.1	50.42	6.7	8.2	80.23	26.0
9.4	52.77	55.2	9.7	39.99	25.6	9.9	50.03	31.8	9.1	50.03	6.4	9.2	78.71	25.9
10.4	52.42	55.6	10.7	40.52	25.8	10.9	50.56	31.4	10.1	49.65	6.2	10.2	77.19	25.8
11.4	52.00	56.0	11.6	41.03	25.9	11.9	51.11	31.1	11.1	49.30	5.9	11.2	75.71	25.6
12.4	51.53	56.3	12.6	41.52	26.1	12.9	51.67	30.8	12.1	48.96	5.7	12.2	74.29	25.5
13.4	51.04	56.7	13.6	41.98	26.3	13.9	52.23	30.6	13.1	48.64	5.4	13.2	72.94	25.3
14.4	50.55	57.0	14.6	42.41	26.5	14.9	52.77	30.3	14.1	48.35	5.1	14.2	71.66	25.1
15.4	50.10	57.3	15.6	42.82	26.7	15.9	53.28	30.1	15.1	48.07	4.8	15.2	70.44	24.9
16.4	49.66	57.6	16.6	43.23	26.9	16.9	53.77	29.8	16.1	47.80	4.6	16.2	69.26	24.8
17.4	49.27	57.9	17.6	43.64	27.0	17.9	54.23	29.5	17.1	47.54	4.4	17.1	68.10	24.6
18.4	48.91	58.3	18.6	44.06	27.2	18.9	54.67	29.3	18.1	47.27	4.1	18.1	66.93	24.5
19.4	48.56	58.6	19.6	44.49	27.3	19.8	55.13	29.0	19.1	46.98	3.9	19.1	65.73	24.3
20.4	48.19	58.9	20.6	44.95	27.5	20.8	55.61	28.7	20.1	46.69	3.7	20.1	64.49	24.2
21.4	47.79	59.3	21.6	45.41	27.6	21.8	56.13	28.4	21.1	46.38	3.4	21.1	63.19	24.0
22.4	47.33	59.6	22.6	45.87	27.8	22.8	56.70	28.1	22.1	46.07	3.1	22.1	61.87	23.9
23.4	46.80	60.0	23.6	46.34	28.0	23.8	57.31	27.8	23.1	45.77	2.8	23.1	60.54	23.7
24.4	46.18	60.3	24.6	46.79	28.3	24.8	57.96	27.5	24.1	45.49	2.5	24.1	59.24	23.5
25.4	45.50	60.7	25.6	47.21	28.5	25.8	58.63	27.2	25.1	45.23	2.2	25.1	57.98	23.3
26.4	44.79	61.0	26.6	47.61	28.8	26.8	59.30	27.0	26.1	44.98	1.9	26.1	56.79	23.0
27.4	44.06	61.3	27.6	47.98	29.0	27.8	59.97	26.8	27.1	44.76	1.6	27.1	55.67	22.8
28.4	43.36	61.6	28.6	48.34	29.3	28.8	60.61	26.6	28.1	44.55	1.2	28.1	54.63	22.5
29.4	42.67	61.9	29.6	48.68	29.5	29.8	61.21	26.4	29.1	44.37	0.9	29.1	53.64	22.3
30.4	42.02	62.1	30.6	49.00	29.7	30.8	61.79	26.2	30.1	44.18	0.6	30.1	52.68	22.1
31.4	41.43	62.4	31.6	49.34	29.9	31.8	62.35	26.0	31.1	43.99	0.3	31.1	51.72	21.9

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hev.).			6 Ursæ Min. (B.).			δ Ursæ Min.			λ Ursæ Min.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.
Dec.	h m 1 26	° ' +88 49	Dec.	h m 6 57	° ' +87 11	Dec.	h m 12 14	° ' +88 12	Dec.	h m 18 1	° ' +86 36	Dec.	h m 19 12	° ' +89 0
	s "			s "			s "			s "			s "	
1.4	41.43	2.4	1.6	49.34	29.9	1.8	2.35	26.0	1.1	43.99	60.3	1.1	51.72	21.9
2.4	40.86	2.6	2.6	49.69	30.1	2.8	2.90	25.7	2.1	43.80	60.1	2.1	50.74	21.7
3.4	40.30	2.9	3.6	50.06	30.3	3.8	3.46	25.5	3.1	43.59	59.8	3.1	49.72	21.5
4.4	39.73	3.2	4.6	50.45	30.6	4.8	4.05	25.3	4.0	43.36	59.5	4.1	48.66	21.3
5.4	39.10	3.5	5.6	50.85	30.8	5.8	4.67	25.1	5.0	43.12	59.2	5.1	47.53	21.1
6.4	38.42	3.8	6.6	51.25	31.0	6.8	5.35	24.8	6.0	42.88	58.9	6.1	46.37	20.8
7.3	37.66	4.1	7.6	51.64	31.3	7.8	6.06	24.6	7.0	42.66	58.6	7.1	45.23	20.6
8.3	36.83	4.4	8.6	52.01	31.6	8.8	6.80	24.4	8.0	42.45	58.2	8.1	44.13	20.3
9.3	35.96	4.7	9.6	52.36	31.9	9.8	7.56	24.2	9.0	42.26	57.8	9.1	43.07	20.0
10.3	35.06	5.0	10.6	52.68	32.2	10.8	8.32	24.1	10.0	42.10	57.5	10.1	42.09	19.7
11.3	34.14	5.3	11.6	52.98	32.5	11.8	9.07	24.0	11.0	41.96	57.1	11.1	41.20	19.4
12.3	33.25	5.5	12.6	53.24	32.8	12.8	9.78	23.8	12.0	41.84	56.8	12.1	40.38	19.1
13.3	32.41	5.7	13.6	53.47	33.1	13.8	10.45	23.7	13.0	41.73	56.4	13.1	39.63	18.8
14.3	31.60	5.9	14.6	53.71	33.4	14.8	11.09	23.6	14.0	41.64	56.1	14.1	38.91	18.6
15.3	30.83	6.1	15.6	53.96	33.6	15.8	11.71	23.5	15.0	41.54	55.8	15.1	38.20	18.3
16.3	30.09	6.3	16.6	54.22	33.9	16.8	12.33	23.4	16.0	41.43	55.5	16.1	37.48	18.1
17.3	29.34	6.5	17.6	54.49	34.1	17.8	12.97	23.2	17.0	41.31	55.2	17.1	36.72	17.8
18.3	28.57	6.7	18.6	54.77	34.4	18.8	13.64	23.1	18.0	41.19	54.9	18.1	35.93	17.6
19.3	27.75	7.0	19.5	55.06	34.7	19.8	14.34	22.9	19.0	41.05	54.6	19.1	35.11	17.3
20.3	26.86	7.2	20.5	55.35	35.0	20.8	15.09	22.8	20.0	40.92	54.2	20.1	34.27	17.0
21.3	25.90	7.4	21.5	55.62	35.3	21.8	15.87	22.6	21.0	40.80	53.8	21.1	33.45	16.7
22.3	24.89	7.6	22.5	55.87	35.6	22.8	16.68	22.5	22.0	40.71	53.5	22.1	32.68	16.4
23.3	23.84	7.8	23.5	56.09	36.0	23.8	17.49	22.4	22.9	40.64	53.1	23.0	31.98	16.1
24.3	22.76	8.0	24.5	56.28	36.3	24.8	18.29	22.3	23.9	40.58	52.7	24.0	31.36	15.7
25.3	21.70	8.2	25.5	56.44	36.6	25.7	19.07	22.3	24.9	40.56	52.3	25.0	30.83	15.4
26.3	20.66	8.3	26.5	56.58	37.0	26.7	19.80	22.2	25.9	40.56	51.9	26.0	30.36	15.0
27.3	19.67	8.4	27.5	56.71	37.3	27.7	20.50	22.2	26.9	40.56	51.6	27.0	29.94	14.7
28.3	18.73	8.5	28.5	56.83	37.6	28.7	21.18	22.2	27.9	40.56	51.2	28.0	29.55	14.4
29.3	17.83	8.7	29.5	56.97	37.9	29.7	21.84	22.1	28.9	40.55	50.9	29.0	29.15	14.1
30.3	16.96	8.8	30.5	57.13	38.1	30.7	22.50	22.1	29.9	40.54	50.6	30.0	28.72	13.8
31.3	16.10	9.0	31.5	57.30	38.4	31.7	23.17	22.0	30.9	40.52	50.3	31.0	28.25	13.5
32.3	15.19	9.1	32.5	57.48	38.7	32.7	23.87	21.9	31.9	40.48	50.0	32.0	27.73	13.2

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Piscium.		$\alpha$ Andromedæ.		$\beta$ Cassiopeiæ.		$\gamma$ Andromedæ.		$\gamma$ Pegasi. (Algenib.)	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m o o	° ' " - 6 13	h m o 3	° ' " +28 34	h m o 4	° ' " +58 37	h m o 5	° ' " +45 33	h m o 8	° ' " +14 39
Jan. 0.2	33.43	49.3	33.81	39.9	11.99	83.5	28.29	24.8	25.80	57.6
10.2	33.32	49.9	33.66	39.0	11.66	82.7	28.08	23.9	25.68	56.8
20.2	33.21	50.4	33.52	37.8	11.34	81.4	27.87	22.6	25.56	55.8
30.2	33.12	50.8	33.39	36.4	11.05	79.7	27.68	21.0	25.45	54.8
Feb. 9.1	33.05	51.0	33.28	34.8	10.80	77.5	27.51	19.1	25.36	53.7
19.1	32.99	51.0	33.20	33.1	10.60	75.1	27.38	16.9	25.29	52.6
Mar. 1.1	32.96	50.9	33.15	31.5	10.46	72.4	27.29	14.6	25.24	51.6
11.0	32.96	50.5	33.13	29.9	10.38	69.7	27.25	12.3	25.23	50.8
21.0	33.00	49.9	33.15	28.4	10.38	67.0	27.26	10.0	25.26	50.2
31.0	33.07	49.0	33.22	27.2	10.46	64.4	27.33	7.9	25.32	49.7
Apr. 10.0	33.18	47.9	33.34	26.2	10.62	62.0	27.46	6.1	25.42	49.6
19.9	33.33	46.6	33.50	25.6	10.85	60.0	27.64	4.6	25.57	49.7
29.9	33.52	45.1	33.71	25.4	11.15	58.4	27.88	3.5	25.76	50.2
May 9.9	33.74	43.4	33.95	25.5	11.52	57.2	28.17	2.9	25.98	50.9
19.9	34.00	41.5	34.23	26.0	11.94	56.6	28.50	2.7	26.24	52.0
29.8	34.28	39.5	34.54	26.9	12.40	56.5	28.86	3.0	26.52	53.4
June 8.8	34.58	37.4	34.87	28.2	12.88	56.9	29.24	3.8	26.82	55.0
18.8	34.89	35.4	35.20	29.8	13.38	57.8	29.64	5.1	27.14	56.8
28.7	35.20	33.4	35.54	31.7	13.88	59.2	30.04	6.7	27.46	58.8
July 8.7	35.51	31.5	35.87	33.9	14.36	61.1	30.42	8.7	27.77	60.9
18.7	35.80	29.7	36.18	36.2	14.81	63.4	30.78	11.1	28.07	63.0
28.7	36.08	28.1	36.47	38.6	15.23	66.0	31.12	13.7	28.34	65.2
Aug. 7.6	36.32	26.8	36.73	41.1	15.60	68.9	31.42	16.5	28.59	67.3
17.6	36.54	25.7	36.95	43.6	15.92	72.0	31.68	19.4	28.81	69.3
27.6	36.72	24.9	37.14	46.0	16.18	75.3	31.89	22.4	28.99	71.1
Sept. 6.6	36.86	24.3	37.29	48.4	16.37	78.7	32.06	25.4	29.14	72.8
16.5	36.96	24.0	37.39	50.6	16.50	82.1	32.17	28.4	29.24	74.3
26.5	37.02	24.0	37.45	52.7	16.57	85.4	32.24	31.3	29.31	75.6
Oct. 6.5	37.04	24.2	37.48	54.5	16.58	88.6	32.26	34.0	29.35	76.6
16.5	37.04	24.6	37.47	56.1	16.53	91.7	32.23	36.5	29.35	77.5
26.4	37.00	25.1	37.43	57.5	16.42	94.5	32.17	38.7	29.32	78.1
Nov. 5.4	36.95	25.8	37.36	58.6	16.26	96.9	32.07	40.6	29.27	78.5
15.4	36.87	26.6	37.27	59.3	16.06	99.0	31.94	42.2	29.20	78.6
25.3	36.78	27.4	37.16	59.8	15.81	100.7	31.78	43.4	29.11	78.6
Dec. 5.3	36.67	28.2	37.03	60.0	15.53	101.9	31.60	44.2	29.00	78.3
15.3	36.56	29.0	36.89	59.9	15.23	102.5	31.40	44.5	28.89	77.9
25.3	36.45	29.7	36.75	59.4	14.91	102.7	31.19	44.4	28.77	77.3
35.2	36.34	30.3	36.61	58.6	14.59	102.3	30.98	43.8	28.65	76.5

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

325

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Andromedæ.		ι Ceti.		44 Piscium.		β Hydri.		ι2 Ceti.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m o 13	° ' " +36 15	h m o 14	° ' " - 9 20	h m o 20	° ' " + 1 25	h m o 20	° ' " -77 46	h m o 25	° ' " - 4 27
Jan. 0.2	27.22	75.7	40.34	32.5	37.15	21.8	49.76	67.2	16.63	85.0
10.2	27.05	74.8	40.23	33.1	37.04	21.1	48.88	66.2	16.51	85.7
20.2	26.88	73.6	40.12	33.5	36.93	20.4	48.06	64.6	16.40	86.2
30.2	26.72	72.1	40.02	33.8	36.82	19.8	47.32	62.5	16.29	86.7
Feb. 9.1	26.58	70.4	39.93	33.9	36.73	19.3	46.68	59.9	16.20	87.0
19.1	26.47	68.6	39.86	33.7	36.66	18.9	46.16	56.9	16.12	87.1
Mar. 1.1	26.40	66.6	39.82	33.4	36.61	18.6	45.77	53.5	16.07	87.0
11.1	26.36	64.7	39.81	32.8	36.59	18.6	45.52	49.9	16.05	86.7
21.0	26.37	62.9	39.83	32.0	36.60	18.7	45.43	46.2	16.06	86.2
31.0	26.42	61.3	39.89	31.0	36.65	19.1	45.49	42.4	16.10	85.5
Apr. 10.0	26.53	59.9	39.98	29.7	36.74	19.7	45.71	38.6	16.19	84.5
19.9	26.69	58.8	40.12	28.2	36.87	20.6	46.09	34.9	16.31	83.3
29.9	26.90	58.2	40.29	26.5	37.04	21.8	46.62	31.3	16.48	81.8
May 9.9	27.16	57.9	40.51	24.7	37.25	23.1	47.28	28.0	16.68	80.1
19.9	27.45	58.0	40.75	22.7	37.49	24.7	48.07	25.0	16.92	78.3
29.8	27.77	58.6	41.03	20.6	37.76	26.5	48.98	22.4	17.19	76.4
June 8.8	28.11	59.6	41.32	18.5	38.05	28.4	49.98	20.1	17.48	74.4
18.8	28.47	61.0	41.63	16.4	38.36	30.4	51.05	18.5	17.78	72.3
28.8	28.83	62.7	41.95	14.4	38.67	32.4	52.16	17.4	18.09	70.2
July 8.7	29.18	64.7	42.26	12.5	38.98	34.4	53.28	16.8	18.40	68.2
18.7	29.52	67.0	42.56	10.7	39.28	36.4	54.38	16.8	18.70	66.4
28.7	29.83	69.5	42.84	9.2	39.56	38.2	55.44	17.3	18.99	64.7
Aug. 7.6	30.11	72.1	43.10	8.0	39.81	39.8	56.42	18.4	19.25	63.3
17.6	30.35	74.8	43.32	7.0	40.04	41.3	57.30	20.1	19.48	62.1
27.6	30.56	77.5	43.52	6.3	40.23	42.5	58.04	22.2	19.68	61.1
Sept. 6.6	30.72	80.1	43.67	5.9	40.39	43.5	58.62	24.6	19.84	60.4
16.5	30.84	82.7	43.79	5.8	40.51	44.2	59.03	27.4	19.96	60.0
26.5	30.92	85.1	43.86	6.0	40.59	44.7	59.25	30.4	20.05	59.9
Oct. 6.5	30.95	87.4	43.90	6.3	40.64	45.0	59.29	33.5	20.10	60.0
16.5	30.95	89.5	43.91	6.9	40.65	45.0	59.14	36.6	20.12	60.3
26.4	30.91	91.3	43.89	7.7	40.64	44.9	58.81	39.5	20.11	60.8
Nov. 5.4	30.84	92.8	43.84	8.5	40.60	44.6	58.31	42.1	20.07	61.4
15.4	30.74	94.0	43.77	9.4	40.54	44.2	57.68	44.3	20.01	62.1
25.3	30.62	94.9	43.68	10.3	40.46	43.6	56.93	46.1	19.94	62.9
Dec. 5.3	30.48	95.4	43.58	11.2	40.36	43.0	56.09	47.3	19.85	63.7
15.3	30.33	95.5	43.47	12.1	40.26	42.3	55.21	47.9	19.74	64.5
25.3	30.17	95.2	43.36	12.8	40.15	41.6	54.30	47.9	19.63	65.2
35.2	30.00	94.6	43.25	13.5	40.04	40.8	53.41	47.3	19.52	65.9

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\pi$ Andromedæ.		$\alpha$ Cassiopeiæ.		$\beta$ Ceti.		$\gamma$ Cassiopeiæ.		$\delta$ Cassiopeiæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m ° 31	° 33 12	h m ° 35	° 56 1	h m ° 38	° 18 29	h m ° 39	° 74 28	h m ° 39	° 47 46
	s	"	s	"	s	"	s	"	s	"
Jan. 0.3	53.97	30.7	13.02	48.4	54.37	63.1	29.84	60.2	31.83	39.6
10.2	53.81	29.9	12.72	48.0	54.24	63.6	29.10	60.2	31.60	39.1
20.2	53.64	28.9	12.43	47.1	54.12	63.8	28.37	59.6	31.37	38.2
30.2	53.49	27.6	12.14	45.7	54.00	63.8	27.67	58.4	31.14	36.9
Feb. 9.1	53.35	26.1	11.88	43.9	53.89	63.6	27.02	56.7	30.94	35.2
19.1	53.23	24.5	11.66	41.8	53.80	63.0	26.46	54.5	30.76	33.2
Mar. 1.1	53.14	22.8	11.48	39.4	53.73	62.2	26.01	51.9	30.62	31.1
11.1	53.09	21.1	11.37	36.9	53.69	61.1	25.69	49.1	30.53	28.8
21.0	53.08	19.4	11.32	34.3	53.69	59.8	25.51	46.1	30.49	26.5
31.0	53.11	18.0	11.34	31.8	53.72	58.2	25.48	43.1	30.52	24.4
Apr. 10.0	53.20	16.7	11.44	29.5	53.79	56.4	25.62	40.2	30.60	22.4
20.0	53.34	15.8	11.61	27.4	53.90	54.4	25.90	37.5	30.75	20.7
29.9	53.52	15.2	11.85	25.7	54.06	52.3	26.32	35.2	30.96	19.3
May 9.9	53.75	14.9	12.16	24.4	54.25	50.0	26.88	33.2	31.22	18.4
19.9	54.02	15.1	12.53	23.6	54.49	47.7	27.55	31.7	31.53	17.8
29.8	54.33	15.7	12.94	23.2	54.75	45.3	28.30	30.7	31.89	17.7
June 8.8	54.66	16.6	13.39	23.4	55.05	42.9	29.12	30.2	32.27	18.2
18.8	55.00	17.9	13.85	24.0	55.36	40.7	29.99	30.3	32.67	19.0
28.8	55.35	19.6	14.33	25.2	55.68	38.6	30.87	30.9	33.08	20.3
July 8.7	55.70	21.5	14.80	26.8	56.00	36.7	31.74	32.1	33.49	22.0
18.7	56.04	23.6	15.25	28.7	56.32	35.1	32.58	33.7	33.89	24.0
28.7	56.35	26.0	15.68	31.1	56.62	33.7	33.37	35.9	34.26	26.3
Aug. 7.7	56.64	28.4	16.07	33.7	56.90	32.7	34.10	38.4	34.61	28.8
17.6	56.90	30.9	16.41	36.6	57.15	32.0	34.74	41.3	34.91	31.6
27.6	57.12	33.4	16.70	39.7	57.37	31.7	35.29	44.5	35.17	34.5
Sept. 6.6	57.30	35.9	16.94	42.9	57.55	31.8	35.74	47.9	35.39	37.4
16.5	57.44	38.3	17.13	46.1	57.69	32.2	36.08	51.4	35.56	40.4
26.5	57.54	40.6	17.26	49.3	57.80	32.8	36.30	55.1	35.68	43.3
Oct. 6.5	57.60	42.7	17.33	52.5	57.86	33.7	36.40	58.8	35.76	46.1
16.5	57.62	44.6	17.34	55.5	57.89	34.9	36.39	62.4	35.79	48.8
26.4	57.61	46.3	17.30	58.3	57.89	36.1	36.26	65.8	35.77	51.3
Nov. 5.4	57.56	47.8	17.21	60.9	57.86	37.5	36.01	69.1	35.72	53.5
15.4	57.49	48.9	17.07	63.1	57.80	38.8	35.65	72.0	35.62	55.4
25.4	57.40	49.7	16.89	64.9	57.72	40.1	35.19	74.6	35.49	56.9
Dec. 5.3	57.28	50.3	16.67	66.3	57.62	41.3	34.64	76.7	35.33	58.0
15.3	57.15	50.5	16.42	67.3	57.51	42.4	34.01	78.2	35.14	58.7
25.3	57.00	50.3	16.15	67.7	57.39	43.3	33.33	79.2	34.93	59.0
35.2	56.84	49.8	15.86	67.6	57.27	43.9	32.60	79.6	34.71	58.8



# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Piscium.		$\gamma$ Cassiopeiæ.		$\mu$ Andromedæ.		43 Cephei (H.).		$\epsilon$ Piscium.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 0 43	° ' " + 7 4	h m 0 51	° ' " + 60 12	h m 0 51	° ' " + 37 59	h m 0 55	° ' " + 85 45	h m 0 58	° ' " + 7 23
	s	"	s	"	s	"	s	"	s	"
Jan. 0.3	50.60	39.2	5.09	58.1	34.74	46.9	58.09	44.3	6.23	16.9
10.2	50.48	38.5	4.75	58.0	34.56	46.4	55.18	44.8	6.11	16.2
20.2	50.36	37.8	4.40	57.3	34.38	45.5	52.26	44.6	5.98	15.5
30.2	50.24	37.0	4.06	56.1	34.20	44.3	49.42	43.8	5.86	14.8
Feb. 9.2	50.13	36.3	3.74	54.5	34.03	42.9	46.78	42.4	5.74	14.1
	50.04	35.7	3.46	52.4	33.88	41.3	44.43	40.5	5.64	13.5
Mar. 1.1	49.97	35.2	3.23	50.1	33.76	39.5	42.48	38.1	5.56	13.0
11.1	49.92	34.8	3.06	47.6	33.68	37.7	40.99	35.3	5.50	12.6
21.0	49.91	34.7	2.97	45.0	33.64	35.8	40.01	32.3	5.48	12.4
31.0	49.94	34.7	2.96	42.3	33.65	34.1	39.58	29.2	5.49	12.5
Apr. 10.0	50.01	35.0	3.03	39.8	33.72	32.6	39.72	26.1	5.54	12.7
20.0	50.12	35.5	3.19	37.6	33.84	31.4	40.40	23.2	5.64	13.2
29.9	50.27	36.3	3.43	35.6	34.01	30.5	41.60	20.5	5.78	14.0
May 9.9	50.46	37.4	3.75	34.0	34.23	29.9	43.26	18.1	5.96	15.0
19.9	50.69	38.7	4.13	32.9	34.50	29.7	45.33	16.1	6.18	16.3
June 29.9	50.95	40.3	4.57	32.3	34.81	30.0	47.73	14.6	6.43	17.8
8.8	51.24	42.0	5.05	32.1	35.14	30.6	50.38	13.6	6.71	19.5
18.8	51.54	43.9	5.56	32.4	35.50	31.6	53.21	13.2	7.00	21.3
28.8	51.85	45.8	6.08	33.3	35.87	33.0	56.12	13.3	7.31	23.2
July 8.7	52.16	47.8	6.60	34.6	36.24	34.7	59.05	14.0	7.62	25.2
18.7	52.47	49.8	7.11	36.4	36.59	36.7	61.92	15.2	7.93	27.2
28.7	52.76	51.7	7.59	38.5	36.93	38.9	64.66	17.0	8.22	29.1
Aug. 7.7	53.02	53.5	8.04	41.0	37.25	41.3	67.21	19.2	8.50	31.0
17.6	53.27	55.2	8.44	43.8	37.53	43.8	69.51	21.8	8.75	32.6
27.6	53.48	56.7	8.79	46.8	37.78	46.4	71.52	24.8	8.97	34.1
Sept. 6.6	53.65	58.0	9.09	50.0	37.99	49.0	73.20	28.1	9.16	35.4
16.5	53.79	59.1	9.32	53.3	38.16	51.5	74.51	31.6	9.31	36.5
26.5	53.90	59.9	9.49	56.6	38.29	54.0	75.42	35.3	9.43	37.3
Oct. 6.5	53.97	60.5	9.60	59.8	38.38	56.3	75.90	39.1	9.52	37.9
16.5	54.01	60.9	9.64	63.0	38.43	58.5	75.95	42.9	9.57	38.3
Nov. 26.5	54.02	61.0	9.62	66.0	38.44	60.5	75.55	46.7	9.59	38.5
5.4	54.00	61.0	9.54	68.8	38.41	62.2	74.70	50.3	9.59	38.5
15.4	53.96	60.8	9.41	71.3	38.36	63.7	73.41	53.7	9.56	38.4
25.4	53.89	60.5	9.22	73.5	38.27	64.9	71.70	56.7	9.51	38.1
Dec. 5.3	53.81	60.1	8.99	75.2	38.16	65.7	69.62	59.3	9.43	37.7
15.3	53.72	59.6	8.71	76.5	38.02	66.2	67.20	61.4	9.34	37.2
25.3	53.61	59.0	8.41	77.2	37.86	66.3	64.53	62.9	9.24	36.6
35.3	53.50	58.3	8.07	77.4	37.69	66.1	61.67	63.8	9.13	35.9

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Andromedæ.			$\kappa$ Tucanæ.			$f$ Piscium.			$\theta$ Ceti.			$\gamma$ Cassiopeiæ.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	I 4		+35 7	I 12		-69 21	I 12		+ 3 7	I 19		- 8 39	I 24		+69 46
Jan. 0.3	30.79		43.1	36.04		99.0	59.44		22.2	21.83		58.6	18.26		81.7
10.2	30.62	.17	42.6	35.51	.53	98.9	59.32	.12	21.5	21.71	.12	59.3	17.74	.52	82.2
20.2	30.45	.17	41.9	34.98	.53	98.2	59.19	.13	20.9	21.58	.13	59.9	17.19	.55	82.1
30.2	30.28	.17	40.9	34.47	.51	97.0	59.06	.13	20.3	21.45	.13	60.3	16.65	.54	81.4
Feb. 9.2	30.11	.17	39.6	34.00	.47	95.2	58.94	.12	19.8	21.33	.12	60.4	16.12	.53	80.2
		.15			.43			.11						.49	
19.1	29.96		38.1	33.57		92.9	58.83		19.3	21.21		60.4	15.63		78.5
Mar. 1.1	29.84	.12	36.5	33.21	.36	90.2	58.74	.09	19.0	21.11	.10	60.2	15.21	.42	76.4
11.1	29.75	.09	34.8	32.93	.28	87.1	58.67	.07	18.9	21.04	.07	59.7	14.87	.34	74.0
21.0	29.70	.05	33.2	32.72	.21	83.7	58.63	.04	19.0	20.99	.05	59.0	14.64	.23	71.3
31.0	29.70	.05	31.6	32.61	.01	80.1	58.63	.04	19.3	20.98	.03	58.0	14.51	.00	68.5
Apr. 10.0	29.75		30.3	32.60		76.4	58.67		19.8	21.01		56.8	14.51		65.7
20.0	29.85	.10	29.1	32.68	.08	72.6	58.75	.08	20.5	21.08	.07	55.3	14.63	.12	63.1
29.9	30.01	.16	28.3	32.86	.18	68.9	58.87	.12	21.5	21.19	.11	53.7	14.87	.24	60.6
May 9.9	30.21	.20	27.8	33.14	.28	65.3	59.04	.17	22.8	21.35	.16	51.9	15.22	.35	58.5
19.9	30.46	.25	27.7	33.52	.46	61.8	59.24	.24	24.2	21.55	.23	49.9	15.68	.46	56.7
		.29												.54	
29.9	30.75		28.0	33.98		58.6	59.48		25.9	21.78		47.8	16.22		55.3
June 8.8	31.07	.32	28.6	34.52	.54	55.8	59.75	.27	27.7	22.05	.27	45.6	16.83	.61	54.5
18.8	31.41	.34	29.6	35.12	.60	53.4	60.04	.29	29.6	22.33	.28	43.4	17.50	.67	54.2
28.8	31.77	.36	31.0	35.77	.65	51.4	60.34	.30	31.5	22.63	.30	41.3	18.20	.70	54.4
July 8.8	32.13	.35	32.6	36.45	.69	50.0	60.65	.31	33.5	22.94	.31	39.2	18.92	.71	55.0
18.7	32.48		34.5	37.14		49.1	60.96		35.5	23.25		37.3	19.63		56.2
28.7	32.82	.34	36.6	37.83	.69	48.8	61.26	.30	37.3	23.55	.30	35.6	20.32	.69	57.8
Aug. 7.7	33.13	.31	38.9	38.49	.66	49.0	61.54	.28	39.0	23.84	.29	34.2	20.98	.66	59.9
17.6	33.42	.26	41.3	39.10	.61	49.9	61.80	.26	40.6	24.10	.26	33.1	21.59	.61	62.3
27.6	33.68	.22	43.7	39.65	.47	51.3	62.03	.20	41.9	24.34	.21	32.2	22.14	.49	65.1
Sept. 6.6	33.90		46.1	40.12		53.2	62.23		43.0	24.55		31.7	22.63		68.1
16.6	34.08	.18	48.5	40.50	.38	55.5	62.40	.17	43.8	24.72	.17	31.5	23.03	.40	71.4
26.5	34.22	.14	50.8	40.77	.27	58.2	62.53	.13	44.4	24.86	.14	31.6	23.36	.33	74.8
Oct. 6.5	34.33	.11	53.0	40.94	.17	61.1	62.63	.10	44.7	24.97	.11	31.9	23.59	.23	78.2
16.5	34.39	.06	55.0	41.00	.06	64.2	62.70	.07	44.8	25.04	.07	32.5	23.74	.15	81.7
		.03												.05	
26.5	34.42		56.8	40.94		67.3	62.74		44.8	25.08		33.3	23.79		85.1
Nov. 5.4	34.41	.01	58.4	40.78	.16	70.2	62.75	.01	44.5	25.09	.01	34.2	23.76	.03	88.4
15.4	34.38	.03	59.8	40.53	.25	72.9	62.73	.02	44.1	25.07	.02	35.2	23.63	.13	91.4
25.4	34.31	.07	60.9	40.19	.34	75.3	62.69	.04	43.6	25.03	.04	36.3	23.41	.22	94.1
Dec. 5.3	34.21	.10	61.7	39.78	.41	77.3	62.62	.07	43.0	24.97	.06	37.4	23.11	.30	96.5
		.12			.47			.08			.08			.38	
15.3	34.09		62.1	39.31		78.7	62.54		42.4	24.89		38.4	22.73		98.4
25.3	33.95	.14	62.2	38.80	.51	79.6	62.44	.10	41.7	24.79	.10	39.3	22.29	.44	99.8
35.3	33.80	.15	62.0	38.28	.52	79.9	62.33	.11	41.0	24.68	.11	40.1	21.79	.50	100.7

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Piscium.		$\nu$ Andromedæ.		$\pi$ Piscium.		$\alpha$ Eridani. (Achernar.)		$\nu$ Piscium.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m I 26	° ' " +14 51	h m I 31	° ' " +40 56	h m I 32	° ' " +11 39	h m I 34	° ' " -57 42	h m I 36	° ' " + 5 0
Jan. 0.3	29.78	56.3	19.80	30.5	9.50	52.9	14.56	57.8	34.93	55.0
10.3	29.66	55.8	19.62	30.4	9.38	52.3	14.24	58.2	34.82	54.3
20.2	29.53	55.1	19.42	30.0	9.25	51.7	13.92	58.1	34.69	53.7
30.2	29.39	54.4	19.22	29.2	9.12	51.0	13.59	57.4	34.56	53.1
Feb. 9.2	29.25	53.6	19.02	28.0	8.98	50.3	13.28	56.2	34.42	52.6
19.2	29.13	52.8	18.83	26.6	8.86	49.6	12.99	54.4	34.30	52.1
Mar. 1.1	29.02	52.0	18.67	25.0	8.75	49.0	12.74	52.2	34.19	51.8
11.1	28.93	51.3	18.54	23.3	8.66	48.5	12.53	49.6	34.10	51.6
21.1	28.88	50.8	18.45	21.5	8.60	48.1	12.37	46.7	34.04	51.5
31.1	28.86	50.4	18.41	19.7	8.58	47.9	12.27	43.5	34.02	51.7
Apr. 10.0	28.89	50.2	18.43	18.1	8.60	47.9	12.24	40.1	34.03	52.1
20.0	28.96	50.2	18.50	16.6	8.66	48.1	12.27	36.5	34.09	52.7
30.0	29.07	50.5	18.63	15.4	8.77	48.5	12.38	32.9	34.19	53.5
May 9.9	29.23	51.0	18.82	14.4	8.92	49.3	12.55	29.3	34.34	54.6
19.9	29.44	51.9	19.06	13.9	9.12	50.2	12.79	25.8	34.52	56.0
29.9	29.68	52.9	19.34	13.7	9.35	51.5	13.10	22.5	34.75	57.5
June 8.9	29.95	54.3	19.67	13.9	9.61	52.9	13.46	19.5	35.00	59.2
18.8	30.24	55.8	20.02	14.5	9.90	54.5	13.87	16.7	35.28	61.0
28.8	30.55	57.5	20.39	15.4	10.21	56.3	14.31	14.4	35.58	62.9
July 8.8	30.87	59.3	20.77	16.7	10.52	58.1	14.78	12.5	35.89	64.8
18.7	31.18	61.2	21.15	18.3	10.83	60.0	15.27	11.1	36.20	66.7
28.7	31.49	63.1	21.52	20.1	11.14	61.9	15.75	10.3	36.50	68.6
Aug. 7.7	31.78	65.0	21.87	22.2	11.43	63.8	16.22	10.0	36.79	70.3
17.7	32.05	66.9	22.20	24.5	11.70	65.5	16.66	10.3	37.06	71.8
27.6	32.30	68.6	22.49	26.9	11.94	67.1	17.06	11.1	37.31	73.2
Sept. 6.6	32.51	70.2	22.75	29.3	12.16	68.5	17.42	12.5	37.52	74.4
16.6	32.69	71.6	22.98	31.8	12.35	69.8	17.71	14.4	37.71	75.3
26.6	32.84	72.8	23.16	34.2	12.50	70.8	17.95	16.7	37.87	76.0
Oct. 6.5	32.96	73.8	23.31	36.6	12.62	71.6	18.11	19.3	37.99	76.4
16.5	33.05	74.7	23.41	38.9	12.71	72.3	18.21	22.1	38.08	76.6
26.5	33.10	75.3	23.47	41.1	12.77	72.7	18.23	25.0	38.15	76.7
Nov. 5.4	33.12	75.7	23.50	43.0	12.80	73.0	18.19	27.9	38.18	76.5
15.4	33.12	76.0	23.49	44.8	12.80	73.1	18.09	30.7	38.18	76.2
25.4	33.09	76.1	23.44	46.2	12.78	73.0	17.92	33.3	38.16	75.8
Dec. 5.4	33.04	76.0	23.36	47.4	12.73	72.8	17.71	35.5	38.12	75.3
15.3	32.96	75.8	23.24	48.3	12.66	72.4	17.46	37.3	38.05	74.7
25.3	32.86	75.4	23.10	48.8	12.57	72.0	17.17	38.6	37.96	74.1
35.3	32.75	75.0	22.93	48.9	12.46	71.5	16.86	39.3	37.86	73.4

## FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♋ Piscium.		♎ Ceti.		♈ Arietis.		♐ Cassiopeiae.		♑ Andromedæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m I 40 s	° ' " + 84 I	h m I 46 s	° ' " - 10 47	h m I 49 s	° ' " + 20 21	h m I 55 s	° ' " + 71 58	h m I 58 s	° ' " + 41 52
Jan. 0.3	28.42	17.7	51.71	51.6	29.64	11.1	29.57	28.1	11.07	65.8
10.3	28.30	17.1	51.59	52.4	29.51	10.7	29.01	29.0	10.90	65.9
20.3	28.17	16.5	51.46	53.1	29.37	10.2	28.41	29.4	10.70	65.7
30.3	28.04	15.9	51.32	53.5	29.22	9.5	27.78	29.2	10.49	65.2
Feb. 9.2	27.90	15.3	51.18	53.6	29.07	8.7	27.16	28.4	10.28	64.3
19.2	27.77	14.7	51.05	53.6	28.93	7.9	26.57	27.1	10.07	63.1
Mar. 1.1	27.66	14.2	50.93	53.3	28.80	7.0	26.03	25.3	9.88	61.7
11.1	27.56	13.8	50.83	52.7	28.69	6.1	25.58	23.2	9.72	60.1
21.1	27.50	13.6	50.76	51.9	28.61	5.3	25.23	20.7	9.60	58.4
31.1	27.47	13.6	50.72	50.9	28.57	4.6	24.99	18.0	9.53	56.7
Apr. 10.0	27.48	13.7	50.72	49.6	28.57	4.1	24.89	15.2	9.52	55.1
20.0	27.54	14.1	50.76	48.0	28.62	3.8	24.93	12.5	9.56	53.5
30.0	27.64	14.7	50.85	46.3	28.72	3.7	25.10	9.9	9.66	52.2
May 9.9	27.78	15.6	50.98	44.3	28.86	3.9	25.40	7.5	9.82	51.1
19.9	27.97	16.7	51.16	42.2	29.05	4.3	25.83	5.4	10.04	50.4
29.9	28.19	18.1	51.37	40.0	29.28	5.0	26.36	3.7	10.30	50.0
June 8.9	28.45	19.6	51.62	37.8	29.54	6.0	26.99	2.5	10.61	49.9
18.8	28.73	21.3	51.89	35.5	29.83	7.3	27.69	1.7	10.95	50.2
28.8	29.03	23.1	52.18	33.3	30.14	8.7	28.44	1.4	11.32	50.9
July 8.8	29.34	25.0	52.48	31.2	30.46	10.3	29.23	1.7	11.70	52.0
18.8	29.65	26.9	52.79	29.3	30.79	12.1	30.03	2.4	12.09	53.3
28.7	29.96	28.7	53.10	27.6	31.11	13.9	30.82	3.6	12.47	54.9
Aug. 7.7	30.25	30.5	53.39	26.1	31.41	15.8	31.59	5.2	12.84	56.8
17.7	30.52	32.1	53.67	24.9	31.70	17.6	32.32	7.3	13.19	58.8
27.7	30.77	33.6	53.93	24.1	31.96	19.4	33.00	9.7	13.51	61.0
Sept. 6.6	30.99	34.9	54.16	23.6	32.20	21.1	33.61	12.4	13.80	63.3
16.6	31.19	36.0	54.36	23.5	32.41	22.7	34.15	15.5	14.06	65.7
26.6	31.35	36.9	54.52	23.6	32.59	24.2	34.60	18.7	14.28	68.0
Oct. 6.5	31.48	37.6	54.65	24.1	32.74	25.5	34.96	22.0	14.47	70.4
16.5	31.57	38.0	54.75	24.8	32.85	26.6	35.23	25.5	14.61	72.6
26.5	31.64	38.2	54.82	25.8	32.93	27.6	35.40	28.9	14.71	74.8
Nov. 5.5	31.68	38.3	54.86	26.9	32.98	28.3	35.46	32.3	14.78	76.8
15.4	31.69	38.2	54.86	28.1	33.00	28.9	35.41	35.5	14.80	78.7
25.4	31.67	38.0	54.84	29.3	32.99	29.3	35.25	38.5	14.79	80.3
Dec. 5.4	31.63	37.6	54.80	30.5	32.95	29.5	35.00	41.2	14.73	81.7
15.3	31.56	37.2	54.73	31.7	32.89	29.6	34.64	43.5	14.64	82.7
25.3	31.48	36.7	54.64	32.7	32.80	29.5	34.19	45.4	14.52	83.5
35.3	31.37	36.1	54.53	33.6	32.69	29.2	33.67	46.7	14.36	83.9

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Arietis.			$\beta$ Trianguli.			$\zeta^1$ Ceti.			$\gamma$ Trianguli.			67 Ceti.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.
	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°
	2	1	+23	2	3	+34	2	8	+8	2	11	+33	2	12	-6
	s	"	"	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.3	55.41		21.3	60.21		53.6	3.84		32.1	46.79		64.0	20.31		73.1
10.3	55.28	.13	21.0	60.06	.15	53.6	3.73	.11	31.5	46.65	.14	64.0	20.20	.11	73.9
20.3	55.14	.14	20.5	59.89	.17	53.4	3.60	.13	30.9	46.49	.16	63.8	20.07	.13	74.6
30.3	54.99	.15	19.9	59.71	.18	52.8	3.46	.14	30.3	46.31	.19	63.3	19.93	.14	75.1
Feb. 9.2	54.83	.16	19.2	59.52	.19	52.0	3.32	.14	29.8	46.12	.18	62.6	19.79	.15	75.5
		.15	18.3		.18	51.0									
19.2	54.68		18.3	59.34		51.0	3.18		29.3	45.94		61.6	19.64		75.6
Mar. 1.2	54.54	.14	17.4	59.17	.17	49.8	3.04	.14	28.8	45.77	.17	60.5	19.51	.13	75.5
11.1	54.42	.12	16.5	59.03	.14	48.4	2.93	.11	28.5	45.63	.14	59.2	19.39	.12	75.2
21.1	54.33	.09	15.6	58.92	.11	47.1	2.84	.09	28.3	45.51	.13	57.9	19.30	.09	74.6
31.1	54.27	.06	14.8	58.86	.06	45.7	2.79	.05	28.3	45.44	.07	56.6	19.24	.06	73.8
		.01	14.1		.02	44.4									
Apr. 10.0	54.26		14.1	58.84		44.4	2.77		28.5	45.41		55.4	19.22		72.8
20.0	54.30	.04	13.6	58.87	.03	43.3	2.80	.03	28.9	45.44	.03	54.4	19.24	.02	71.5
30.0	54.38	.08	13.4	58.96	.09	42.3	2.87	.07	29.5	45.52	.08	53.5	19.30	.06	70.0
May 10.0	54.52	.14	13.3	59.10	.14	41.6	2.99	.12	30.3	45.65	.13	52.9	19.41	.11	68.3
19.9	54.70	.18	13.6	59.30	.20	41.3	3.15	.16	31.4	45.84	.19	52.5	19.56	.15	66.4
		.22	13.6		.24	41.3									
29.9	54.92		14.1	59.54		41.2	3.36		32.7	46.07		52.4	19.75		64.4
June 8.9	55.18	.26	14.9	59.82	.28	41.4	3.59	.23	34.1	46.34	.27	52.7	19.98	.23	62.3
18.9	55.47	.29	16.0	60.14	.32	42.0	3.86	.27	35.7	46.65	.31	53.2	20.24	.26	60.2
28.8	55.78	.31	17.3	60.47	.33	42.9	4.15	.29	37.5	46.98	.34	54.1	20.52	.28	58.0
July 8.8	56.10	.32	18.8	60.82	.35	44.1	4.45	.30	39.3	47.32	.36	55.3	20.81	.29	55.9
		.33	18.8		.36	44.1									
18.8	56.43		20.4	61.18		45.5	4.76		41.1	47.68		56.6	21.12		54.0
28.7	56.76	.33	22.2	61.54	.36	47.2	5.07	.31	42.9	48.03	.35	58.2	21.42	.30	52.2
Aug. 7.7	57.07	.31	24.0	61.88	.34	49.0	5.37	.30	44.6	48.37	.34	60.0	21.72	.30	50.6
17.7	57.37	.30	25.8	62.21	.33	50.9	5.65	.28	46.2	48.70	.33	61.9	22.00	.28	49.3
27.7	57.65	.28	27.6	62.51	.30	52.9	5.92	.27	47.6	49.00	.30	63.8	22.27	.27	48.3
		.25	27.6		.28	52.9									
Sept. 6.6	57.90		29.3	62.79		55.0	6.16		48.8	49.28		65.8	22.51		47.6
16.6	58.12	.22	31.0	63.03	.24	57.1	6.37	.21	49.9	49.53	.25	67.8	22.73	.22	47.3
26.6	58.31	.19	32.6	63.24	.21	59.1	6.56	.19	50.7	49.75	.22	69.8	22.91	.18	47.2
Oct. 6.6	58.47	.16	34.0	63.42	.18	61.1	6.71	.15	51.3	49.93	.18	71.7	23.07	.16	47.5
16.5	58.60	.13	35.2	63.56	.14	63.0	6.84	.13	51.7	50.08	.15	73.5	23.20	.13	48.0
		.10	35.2		.11	63.0									
26.5	58.70		36.3	63.67		64.8	6.93		51.9	50.20		75.1	23.29		48.7
Nov. 5.5	58.76	.06	37.2	63.74	.07	66.4	7.00	.07	51.9	50.28	.08	76.7	23.36	.07	49.6
15.4	58.79	.03	37.9	63.77	.03	67.8	7.03	.03	51.7	50.32	.04	78.0	23.39	.03	50.7
25.4	58.79	.00	38.5	63.77	.00	69.0	7.04	.01	51.5	50.33	.01	79.2	23.39	.00	51.8
Dec. 5.4	58.77	.02	38.9	63.74	.03	70.0	7.02	.02	51.1	50.30	.03	80.2	23.37	.02	52.9
		.06	38.9		.07	70.0									
15.4	58.71	.08	39.1	63.67	.10	70.8	6.97	.07	50.6	50.24	.09	80.9	23.32	.08	54.0
25.3	58.63	.11	39.1	63.57	.13	71.3	6.90	.07	50.1	50.15	.12	81.4	23.24	.08	55.0
35.3	58.52		39.0	63.44		71.5	6.81	.09	49.6	50.03		81.6	23.15	.09	55.9

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Hydri.		$\epsilon$ Cassiopeiæ.		$\xi^3$ Ceti.		$\mu$ Hydri.		$\delta$ Ceti.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 2 20	° ' " 4	h m 2 21	° ' " 58	h m 2 23	° ' " 2	h m 2 33	° ' " 30	h m 2 34	° ' " 4
Jan. 0.3	6.02	82.2	24.41	73.5	12.53	30.2	39.81	80.5	42.69	29.4
10.3	5.49	83.1	24.02	74.6	12.42	29.6	38.68	81.4	42.59	30.2
20.3	4.94	83.4	23.58	75.2	12.30	29.0	37.49	81.6	42.47	30.8
30.3	4.37	83.0	23.11	75.3	12.16	28.4	36.27	81.3	42.33	31.4
Feb. 9.2	3.80	82.1	22.63	74.8	12.01	27.9	35.06	80.4	42.18	31.9
19.2	3.26	80.6	22.16	73.8	11.86	27.5	33.89	78.9	42.03	32.2
Mar. 1.2	2.75	78.7	21.72	72.4	11.72	27.1	32.79	76.9	41.89	32.3
11.1	2.30	76.2	21.33	70.5	11.60	26.8	31.79	74.4	41.76	32.3
21.1	1.92	73.3	21.02	68.3	11.50	26.7	30.92	71.5	41.65	32.0
31.1	1.61	70.1	20.79	65.9	11.43	26.7	30.19	68.3	41.57	31.6
Apr. 10.1	1.39	66.7	20.66	63.3	11.40	26.8	29.63	64.9	41.53	31.0
20.0	1.26	63.1	20.64	60.7	11.41	27.2	29.24	61.3	41.53	30.1
30.0	1.24	59.3	20.73	58.2	11.47	27.8	29.05	57.5	41.57	29.0
May 10.0	1.32	55.6	20.93	55.9	11.58	28.7	29.06	53.8	41.66	27.8
19.9	1.51	51.9	21.23	53.9	11.72	29.7	29.26	50.1	41.79	26.3
29.9	1.79	48.3	21.62	52.2	11.91	31.0	29.65	46.5	41.97	24.6
June 8.9	2.17	44.9	22.10	50.9	12.14	32.4	30.22	43.2	42.18	22.8
18.9	2.64	41.9	22.65	50.0	12.40	34.0	30.97	40.2	42.43	20.9
28.8	3.17	39.2	23.24	49.6	12.68	35.7	31.87	37.6	42.70	19.0
July 8.8	3.77	37.0	23.88	49.6	12.98	37.5	32.89	35.4	42.99	17.1
18.8	4.40	35.3	24.53	50.1	13.28	39.3	34.01	33.7	43.29	15.2
28.8	5.06	34.1	25.19	51.0	13.59	41.0	35.20	32.5	43.59	13.4
Aug. 7.7	5.73	33.6	25.84	52.4	13.89	42.7	36.42	31.9	43.89	11.8
17.7	6.38	33.6	26.46	54.2	14.18	44.2	37.63	32.0	44.18	10.4
27.7	7.00	34.2	27.05	56.3	14.46	45.6	38.80	32.7	44.45	9.2
Sept. 6.6	7.57	35.4	27.60	58.7	14.71	46.8	39.89	33.9	44.70	8.3
16.6	8.07	37.2	28.09	61.4	14.93	47.8	40.86	35.7	44.94	7.6
26.6	8.49	39.4	28.52	64.3	15.13	48.6	41.68	38.0	45.14	7.2
Oct. 6.6	8.82	42.1	28.89	67.4	15.30	49.1	42.33	40.7	45.32	7.1
16.5	9.04	45.0	29.18	70.6	15.44	49.5	42.77	43.6	45.46	7.3
26.5	9.16	48.2	29.40	73.8	15.55	49.6	43.00	46.8	45.58	7.6
Nov. 5.5	9.17	51.4	29.53	76.9	15.63	49.6	43.01	50.0	45.67	8.2
15.5	9.07	54.5	29.58	80.0	15.68	49.4	42.79	53.2	45.73	8.8
25.4	8.87	57.4	29.54	82.9	15.70	49.1	42.36	56.2	45.76	9.6
Dec. 5.4	8.57	60.1	29.42	85.6	15.69	48.7	41.73	58.8	45.76	10.5
15.4	8.20	62.3	29.22	87.9	15.66	48.2	40.93	61.1	45.73	11.3
25.3	7.75	64.1	28.94	89.8	15.60	47.7	39.97	62.9	45.67	12.2
35.3	7.25	65.3	28.59	91.3	15.51	47.2	38.90	64.1	45.59	13.0

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\theta$ Persei.		$\gamma$ Ceti.		$\sigma$ Arietis.		47 Cephei (H.).		$\epsilon$ Arietis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 2 37	° ' " +48 49	h m 2 38	° ' " +2 50	h m 2 46	° ' " +14 41	h m 2 53	° ' " +79 2	h m 2 53	° ' " +20 57
Jan. 0.3	50.79	72.4	28.65	30.8	21.25	52.0	44.55	75.5	53.45	64.2
10.3	50.61	73.1	28.55	30.1	21.15	51.6	43.73	77.3	53.36	64.1
20.3	50.39	73.5	28.43	29.5	21.03	51.2	42.79	78.7	53.23	63.8
30.3	50.15	73.4	28.29	28.9	20.89	50.7	41.76	79.4	53.08	63.5
Feb. 9.2	49.89	73.0	28.15	28.4	20.74	50.2	40.69	79.5	52.92	63.0
19.2	49.63	72.1	28.00	28.1	20.58	49.7	39.61	79.0	52.75	62.5
Mar. 1.2	49.39	71.0	27.85	27.8	20.42	49.2	38.58	78.0	52.59	61.8
11.2	49.17	69.5	27.72	27.7	20.28	48.7	37.64	76.4	52.43	61.2
21.1	48.98	67.9	27.60	27.8	20.16	48.3	36.82	74.4	52.30	60.6
31.1	48.85	66.1	27.52	28.1	20.07	48.0	36.17	72.0	52.20	60.0
Apr. 10.1	48.77	64.2	27.48	28.6	20.02	47.8	35.71	69.4	52.14	59.5
20.0	48.76	62.4	27.48	29.3	20.01	47.8	35.46	66.6	52.13	59.1
30.0	48.81	60.7	27.52	30.2	20.05	48.0	35.43	63.8	52.16	58.9
May 10.0	48.93	59.1	27.60	31.3	20.14	48.4	35.62	61.0	52.24	58.9
20.0	49.12	57.8	27.73	32.6	20.27	49.0	36.02	58.4	52.37	59.1
29.9	49.37	56.8	27.91	34.1	20.44	49.8	36.62	56.0	52.55	59.6
June 8.9	49.67	56.2	28.12	35.7	20.66	50.9	37.40	54.0	52.77	60.2
18.9	50.02	55.8	28.36	37.5	20.91	52.1	38.33	52.3	53.02	61.1
28.9	50.40	55.9	28.63	39.3	21.19	53.4	39.39	51.1	53.30	62.2
July 8.8	50.81	56.3	28.92	41.2	21.48	54.9	40.55	50.4	53.60	63.5
18.8	51.23	57.0	29.22	43.0	21.79	56.5	41.78	50.2	53.91	64.8
28.8	51.66	58.1	29.52	44.7	22.10	58.1	43.06	50.4	54.24	66.3
Aug. 7.7	52.09	59.5	29.82	46.3	22.41	59.7	44.34	51.1	54.56	67.8
17.7	52.50	61.2	30.11	47.8	22.71	61.2	45.61	52.3	54.87	69.4
27.7	52.89	63.1	30.39	49.0	23.00	62.7	46.84	53.9	55.17	70.9
Sept. 6.7	53.25	65.1	30.65	50.1	23.27	64.0	48.01	55.9	55.45	72.3
16.6	53.58	67.4	30.88	50.8	23.51	65.2	49.10	58.4	55.71	73.7
26.6	53.88	69.7	31.09	51.3	23.73	66.2	50.08	61.1	55.94	74.9
Oct. 6.6	54.14	72.1	31.27	51.6	23.93	67.0	50.94	64.1	56.15	76.0
16.6	54.36	74.5	31.42	51.6	24.10	67.7	51.65	67.3	56.33	77.0
26.5	54.54	76.9	31.54	51.4	24.24	68.2	52.21	70.7	56.48	77.8
Nov. 5.5	54.67	79.2	31.64	51.0	24.34	68.5	52.60	74.2	56.60	78.5
15.5	54.76	81.4	31.70	50.5	24.42	68.7	52.81	77.7	56.69	79.1
25.4	54.79	83.5	31.73	49.8	24.47	68.8	52.83	81.1	56.75	79.5
Dec. 5.4	54.78	85.4	31.74	49.1	24.48	68.7	52.65	84.3	56.77	79.8
15.4	54.72	87.0	31.71	48.4	24.47	68.6	52.28	87.3	56.76	80.0
25.4	54.61	88.3	31.66	47.7	24.42	68.3	51.72	89.9	56.72	80.1
35.3	54.46	89.3	31.58	47.0	24.34	68.0	51.00	92.1	56.64	80.1

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ceti.		$\beta$ Persei.		48 Cephei (H.).		$\zeta$ Arietis.		$\alpha$ Persei.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 2 57	° ' " + 3 43	h m 3 2	° ' " + 40 35	h m 3 8	° ' " + 77 23	h m 3 9	° ' " + 20 41	h m 3 17	° ' " + 49 31
Jan. 0.4	24.92	22.7	7.00	53.9	32.37	45.3	33.23	57.0	41.11	53.5
10.3	24.83	22.0	6.87	54.5	31.72	47.3	33.14	56.9	40.96	54.6
20.3	24.71	21.4	6.70	54.8	30.95	48.8	33.02	56.6	40.76	55.3
30.3	24.58	20.8	6.51	54.8	30.09	49.7	32.88	56.3	40.53	55.6
Feb. 9.2	24.43	20.4	6.30	54.5	29.17	50.0	32.72	55.9	40.27	55.6
19.2	24.27	20.0	6.08	53.9	28.24	49.7	32.55	55.4	40.00	55.2
Mar. 1.2	24.12	19.7	5.86	53.1	27.33	48.8	32.38	54.9	39.73	54.5
11.2	23.98	19.6	5.66	52.0	26.49	47.4	32.22	54.3	39.48	53.4
21.1	23.85	19.7	5.48	50.8	25.75	45.6	32.08	53.8	39.25	52.0
31.1	23.76	19.9	5.35	49.4	25.15	43.3	31.97	53.2	39.07	50.5
Apr. 10.1	23.69	20.3	5.26	48.0	24.70	40.8	31.89	52.8	38.94	48.8
20.1	23.67	20.9	5.22	46.6	24.44	38.1	31.86	52.4	38.87	47.0
30.0	23.69	21.7	5.24	45.3	24.36	35.3	31.88	52.2	38.87	45.3
May 10.0	23.76	22.8	5.33	44.2	24.47	32.6	31.94	52.2	38.94	43.7
20.0	23.88	24.0	5.47	43.2	24.77	30.0	32.06	52.4	39.08	42.2
29.9	24.04	25.4	5.67	42.5	25.25	27.6	32.22	52.8	39.28	41.0
June 8.9	24.23	26.9	5.92	42.1	25.89	25.5	32.42	53.4	39.54	40.0
18.9	24.47	28.6	6.21	42.0	26.68	23.8	32.66	54.3	39.85	39.3
28.9	24.73	30.4	6.53	42.2	27.59	22.5	32.93	55.3	40.21	38.9
July 8.8	25.01	32.2	6.89	42.6	28.59	21.6	33.23	56.4	40.60	38.9
18.8	25.30	34.0	7.26	43.4	29.66	21.2	33.54	57.7	41.01	39.2
28.8	25.60	35.7	7.64	44.4	30.78	21.2	33.85	59.1	41.44	39.9
Aug. 7.8	25.90	37.3	8.02	45.6	31.92	21.7	34.17	60.5	41.87	40.8
17.7	26.20	38.7	8.39	47.1	33.05	22.7	34.49	62.0	42.30	42.0
27.7	26.48	39.9	8.75	48.7	34.16	24.1	34.79	63.4	42.72	43.4
Sept. 6.7	26.75	40.9	9.09	50.4	35.22	26.0	35.08	64.7	43.12	45.1
16.6	26.99	41.7	9.40	52.2	36.22	28.2	35.35	66.0	43.50	46.9
26.6	27.21	42.2	9.69	54.1	37.13	30.7	35.60	67.2	43.85	48.9
Oct. 6.6	27.41	42.5	9.95	56.0	37.94	33.6	35.82	68.2	44.16	51.0
16.6	27.58	42.5	10.18	57.9	38.64	36.7	36.01	69.1	44.44	53.2
26.5	27.72	42.3	10.37	59.8	39.21	39.9	36.18	69.8	44.68	55.4
Nov. 5.5	27.84	42.0	10.52	61.6	39.63	43.3	36.32	70.5	44.88	57.6
15.5	27.92	41.5	10.63	63.4	39.89	46.7	36.42	71.0	45.03	59.8
25.5	27.97	40.8	10.70	65.0	39.99	50.0	36.50	71.4	45.13	61.9
Dec. 5.4	27.99	40.2	10.73	66.4	39.92	53.2	36.54	71.7	45.17	63.9
15.4	27.98	39.4	10.72	67.7	39.67	56.2	36.54	71.9	45.16	65.7
25.4	27.94	38.7	10.66	68.8	39.26	58.9	36.51	72.0	45.10	67.2
35.3	27.87	38.0	10.56	69.6	38.70	61.2	36.44	71.9	44.99	68.5



# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Hydri.		β Tauri.		ε Eridani.		δ Persei.		γ Camelopardalis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 3 18	° ' " -77 43	h m 3 25	° ' " +12 36	h m 3 28	° ' " -9 46	h m 3 36	° ' " +47 29	h m 3 40	° ' " +71 2
Jan. 0.4	19.14	65.5	44.28	60.4	32.98	33.1	18.39	28.5	33.56	51.9
10.3	18.25	67.0	44.21	60.0	32.90	34.3	18.27	29.6	33.22	54.0
20.3	17.27	68.0	44.10	59.6	32.78	35.2	18.10	30.4	32.79	55.6
30.3	16.23	68.4	43.97	59.2	32.65	36.0	17.89	30.9	32.27	56.8
Feb. 9.3	15.16	68.2	43.82	58.8	32.49	36.5	17.65	31.0	31.70	57.4
19.2	14.08	67.4	43.65	58.4	32.32	36.8	17.39	30.8	31.10	57.5
Mar. 1.2	13.04	66.1	43.49	58.0	32.15	36.8	17.13	30.2	30.50	57.0
11.2	12.06	64.2	43.33	57.7	31.98	36.5	16.88	29.3	29.92	56.0
21.2	11.16	61.9	43.18	57.5	31.83	36.0	16.65	28.2	29.39	54.6
31.1	10.36	59.2	43.06	57.3	31.70	35.2	16.46	26.8	28.94	52.8
Apr. 10.1	9.69	56.1	42.98	57.3	31.61	34.2	16.31	25.3	28.58	50.6
20.1	9.16	52.8	42.93	57.4	31.55	32.9	16.22	23.7	28.34	48.2
30.0	8.79	49.3	42.93	57.7	31.53	31.4	16.20	22.1	28.22	45.7
May 10.0	8.58	45.6	42.98	58.1	31.56	29.7	16.24	20.6	28.23	43.2
20.0	8.55	41.9	43.07	58.7	31.64	27.8	16.35	19.2	28.38	40.7
30.0	8.69	38.3	43.21	59.5	31.76	25.8	16.53	18.0	28.65	38.4
June 8.9	9.00	34.7	43.39	60.5	31.92	23.6	16.76	17.0	29.03	36.3
18.9	9.48	31.4	43.61	61.7	32.12	21.4	17.04	16.3	29.52	34.5
28.9	10.10	28.4	43.86	63.0	32.35	19.1	17.37	15.9	30.11	33.1
July 8.9	10.86	25.7	44.14	64.4	32.61	17.0	17.74	15.8	30.77	32.0
18.8	11.73	23.5	44.43	65.9	32.89	14.9	18.13	15.9	31.49	31.3
28.8	12.69	21.8	44.73	67.3	33.18	13.0	18.54	16.4	32.26	31.1
Aug. 7.8	13.70	20.6	45.03	68.8	33.47	11.4	18.96	17.2	33.05	31.3
17.7	14.75	20.0	45.34	70.2	33.77	10.0	19.38	18.2	33.85	31.9
27.7	15.79	20.1	45.64	71.4	34.05	8.9	19.79	19.4	34.65	32.9
Sept. 6.7	16.80	20.7	45.92	72.5	34.33	8.2	20.18	20.8	35.42	34.3
16.7	17.74	22.0	46.19	73.5	34.59	7.9	20.56	22.4	36.17	36.0
26.6	18.58	23.8	46.44	74.3	34.83	7.9	20.92	24.2	36.87	38.1
Oct. 6.6	19.30	26.1	46.66	74.9	35.05	8.2	21.24	26.1	37.51	40.5
16.6	19.86	28.8	46.86	75.3	35.24	8.9	21.54	28.0	38.08	43.2
26.6	20.25	31.9	47.04	75.6	35.40	9.9	21.79	30.0	38.58	46.0
Nov. 5.5	20.46	35.1	47.18	75.7	35.54	11.1	22.01	32.0	38.98	49.0
15.5	20.48	38.4	47.30	75.7	35.64	12.5	22.19	34.0	39.29	52.1
25.5	20.30	41.6	47.39	75.5	35.72	13.9	22.31	36.0	39.49	55.1
Dec. 5.4	19.94	44.6	47.44	75.3	35.76	15.4	22.39	37.9	39.57	58.1
15.4	19.40	47.3	47.46	75.1	35.76	16.9	22.41	39.6	39.54	61.0
25.4	18.71	49.6	47.44	74.7	35.73	18.2	22.38	41.1	39.39	63.7
35.4	17.89	51.5	47.39	74.4	35.67	19.5	22.29	42.4	39.12	66.0

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Tauri.		$\zeta$ Persei.		$\gamma$ Hydri.		$\epsilon$ Persei.		$\gamma$ Eridani.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 3 41	° ' " +23 48	h m 3 48	° ' " +31 36	h m 3 48	° ' " -74 31	h m 3 51	° ' " +39 44	h m 3 53	° ' " -13 46
	s	"	s	"	s	"	s	"	s	"
Jan. 0.4	57.40	61.4 .02	17.24	26.8 .05	43.53	48.1 .20	36.97	30.0 .08	41.64	33.8 .14
10.3	57.33	61.6 .00	17.17	27.3 .03	42.89	50.1 .14	36.89	30.8 .07	41.57	35.2 .12
20.3	57.23	61.6 .02	17.06	27.6 .01	42.16	51.5 .09	36.76	31.5 .04	41.46	36.4 .09
30.3	57.09	61.4 .02	16.91	27.7 .00	41.36	52.4 .03	36.59	31.9 .01	41.32	37.3 .07
Feb. 9.3	56.93	61.2 .03	16.73	27.7 .03	40.52	52.7 .02	36.39	32.0 .02	41.17	38.0 .03
	19.2	56.75	16.54	27.4 .04	39.66	52.5 .08	36.18	31.8 .04	40.99	38.3 .01
Mar. 1.2	56.57	60.5 .05	16.34	27.0 .06	38.80	51.7 .14	35.95	31.4 .06	40.81	38.4 .03
11.2	56.39	60.0 .05	16.15	26.4 .07	37.97	50.3 .19	35.73	30.8 .09	40.63	38.1 .05
21.2	56.23	59.5 .06	15.97	25.7 .08	37.19	48.4 .23	35.52	29.9 .10	40.46	37.6 .08
31.1	56.09	58.9 .05	15.81	24.9 .08	36.48	46.1 .27	35.35	28.9 .12	40.32	36.8 .11
	10.1	55.99	15.69	24.1 .08	35.87	43.4 .31	35.21	27.7 .12	40.20	35.7 .14
Apr. 20.1	55.92	57.9 .04	15.62	23.3 .08	35.36	40.3 .33	35.12	26.5 .12	40.12	34.3 .17
30.1	55.91	57.5 .02	15.60	22.5 .07	34.97	37.0 .35	35.09	25.3 .11	40.08	32.6 .18
May 10.0	55.94	57.3 .00	15.63	21.8 .05	34.71	33.5 .37	35.11	24.2 .10	40.09	30.8 .21
20.0	56.03	57.3 .01	15.71	21.3 .04	34.58	29.8 .36	35.20	23.2 .08	40.14	28.7 .22
	30.0	56.16	15.84	20.9 .01	34.60	26.2 .36	35.34	22.4 .06	40.23	26.5 .23
June 8.9	56.34	57.7 .05	16.03	20.8 .00	34.76	22.6 .35	35.53	21.8 .04	40.37	24.2 .23
18.9	56.56	58.2 .07	16.26	20.8 .03	35.05	19.1 .33	35.78	21.4 .02	40.55	21.9 .24
28.9	56.82	58.9 .08	16.52	21.1 .04	35.48	15.8 .30	36.06	21.2 .01	40.77	19.5 .23
July 8.9	57.10	59.7 .10	16.81	21.5 .07	36.02	12.8 .26	36.38	21.3 .03	41.01	17.2 .21
	18.8	57.40	17.13	22.2 .08	36.66	10.2 .21	36.73	21.6 .05	41.28	15.1 .20
28.8	57.72	61.8 .12	17.47	23.0 .10	37.39	8.1 .15	37.09	22.1 .08	41.56	13.1 .17
Aug. 7.8	58.04	63.0 .12	17.81	24.0 .11	38.18	6.6 .10	37.46	22.9 .09	41.85	11.4 .14
17.8	58.36	64.2 .12	18.15	25.1 .11	39.01	5.6 .04	37.84	23.8 .11	42.15	10.0 .11
27.7	58.68	65.4 .12	18.49	26.2 .12	39.86	5.2 .02	38.21	24.9 .13	42.44	8.9 .07
	6.7	58.99	18.82	27.4 .13	40.69	5.4 .09	38.57	26.2 .13	42.73	8.2 .03
16.7	59.28	67.7 .11	19.14	28.7 .13	41.49	6.3 .14	38.92	27.5 .14	43.00	7.9 .01
26.6	59.55	68.8 .10	19.43	30.0 .12	42.23	7.7 .20	39.24	28.9 .15	43.26	8.0 .05
Oct. 6.6	59.81	69.8 .09	19.71	31.2 .12	42.88	9.7 .25	39.55	30.4 .15	43.49	8.5 .09
16.6	60.04	70.7 .08	19.96	32.4 .12	43.43	12.2 .28	39.83	31.9 .16	43.71	9.4 .12
	26.6	60.24	20.18	33.6 .11	43.85	15.0 .32	40.08	33.5 .15	43.90	10.6 .14
Nov. 5.5	60.42	72.2 .06	20.38	34.7 .11	44.13	18.2 .33	40.29	35.0 .15	44.06	12.0 .16
15.5	60.56	72.8 .06	20.54	35.8 .10	44.27	21.5 .33	40.47	36.5 .15	44.19	13.6 .17
25.5	60.67	73.4 .04	20.67	36.8 .09	44.25	24.8 .32	40.61	38.0 .14	44.28	15.3 .18
Dec. 5.5	60.75	73.8 .04	20.75	37.7 .08	44.08	28.0 .30	40.70	39.4 .13	44.34	17.1 .18
	15.4	60.78	20.80	38.5 .07	43.77	31.0 .27	40.75	40.7 .12	44.37	18.9 .16
25.4	60.78	74.5 .02	20.80	39.2 .06	43.32	33.7 .23	40.75	41.9 .10	44.36	20.5 .15
35.4	60.74	74.7 .02	20.75	39.8 .05	42.75	36.0 .23	40.70	42.9 .10	44.31	22.0 .15

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	A <sup>1</sup> Tauri.		ε Persei.		σ <sup>1</sup> Eridani.		γ Tauri.		ε Tauri.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 3 59	° ' " +21 49	h m 4 1	° ' " +47 27	h m 4 7	° ' " - 7 4	h m 4 14	° ' " +15 24	h m 4 23	° ' " +18 58
	s	"	s	"	s	"	s	"	s	"
Jan. 0.4	11.93 .06	37.7 0.1	54.94 .09	53.9 1.3	19.76 .05	57.0 1.2	30.20 .04	7.0 0.2	11.35 .03	23.7 0.0
10.4	11.87 .09	37.8 0.0	54.85 .15	55.2 1.0	19.71 .10	58.2 1.1	30.16 .08	6.8 0.3	11.32 .08	23.7 0.1
20.4	11.78 .13	37.8 0.1	54.70 .19	56.2 0.7	19.51 .12	59.3 0.8	30.08 .11	6.5 0.2	11.24 .11	23.6 0.1
30.3	11.65 .15	37.7 0.2	54.51 .23	56.9 0.4	19.49 .15	60.1 0.6	29.97 .14	6.3 0.3	11.13 .14	23.5 0.2
Feb. 9.3	11.50 .17	37.5 0.2	54.28 .26	57.3 0.0	19.34 .16	60.7 0.4	29.83 .17	6.0 0.2	10.99 .17	23.3 0.2
19.3	11.33 .19	37.3 0.3	54.02 .26	57.3 0.3	19.18 .18	61.1 0.2	29.66 .17	5.8 0.3	10.82 .18	23.1 0.2
Mar. 1.2	11.14 .18	37.0 0.4	53.76 .26	57.0 0.6	19.00 .17	61.3 0.1	29.49 .18	5.5 0.2	10.64 .18	22.9 0.2
11.2	10.96 .17	36.6 0.5	53.50 .24	56.4 0.9	18.83 .17	61.2 0.3	29.31 .17	5.3 0.2	10.46 .17	22.7 0.3
21.2	10.79 .14	36.1 0.4	53.26 .22	55.5 1.2	18.66 .15	60.9 0.6	29.14 .15	5.1 0.2	10.29 .16	22.4 0.2
31.2	10.65 .12	35.7 0.4	53.04 .17	54.3 1.3	18.51 .11	60.3 0.8	28.99 .12	4.9 0.1	10.13 .13	22.2 0.3
Apr. 10.1	10.53 .07	35.3 0.3	52.87 .11	53.0 1.5	18.40 .09	59.5 1.0	28.87 .08	4.8 0.0	10.00 .09	21.9 0.1
20.1	10.46 .03	35.0 0.3	52.76 .06	51.5 1.5	18.31 .05	58.5 1.3	28.79 .05	4.8 0.1	9.91 .05	21.8 0.1
30.1	10.43 .02	34.7 0.1	52.70 .01	50.0 1.5	18.26 .00	57.2 1.4	28.74 .00	4.9 0.2	9.86 .01	21.7 0.0
May 10.0	10.45 .06	34.6 0.0	52.71 .07	48.5 1.5	18.26 .04	55.8 1.7	28.74 .05	5.1 0.4	9.85 .04	21.7 0.2
20.0	10.51 .12	34.6 0.2	52.78 .14	47.0 1.3	18.30 .09	54.1 1.8	28.79 .10	5.5 0.6	9.89 .09	21.9 0.3
30.0	10.63 .16	34.8 0.4	52.92 .20	45.7 1.1	18.39 .13	52.3 2.0	28.89 .14	6.1 0.6	9.98 .14	22.2 0.4
June 9.0	10.79 .20	35.2 0.5	53.12 .26	44.6 0.9	18.52 .17	50.3 2.0	29.03 .18	6.7 0.9	10.12 .18	22.6 0.6
18.9	10.99 .24	35.7 0.7	53.38 .30	43.7 0.6	18.69 .20	48.3 2.1	29.21 .22	7.6 0.9	10.30 .21	23.2 0.8
28.9	11.23 .27	36.4 0.9	53.68 .35	43.1 0.3	18.89 .24	46.2 2.0	29.43 .24	8.5 1.1	10.51 .25	24.0 0.8
July 8.9	11.50 .29	37.3 0.9	54.03 .38	42.8 0.1	19.13 .26	44.2 2.0	29.67 .27	9.6 1.1	10.76 .27	24.8 0.9
18.9	11.79 .30	38.2 1.1	54.41 .40	42.7 0.2	19.39 .27	42.2 1.9	29.94 .29	10.7 1.2	11.03 .29	25.7 1.0
28.8	12.09 .32	39.3 1.1	54.81 .41	42.9 0.4	19.66 .29	40.3 1.6	30.23 .30	11.9 1.2	11.32 .30	26.7 1.0
Aug. 7.8	12.41 .32	40.4 1.1	55.22 .42	43.3 0.7	19.95 .29	38.7 1.4	30.53 .31	13.1 1.1	11.62 .31	27.7 1.0
17.8	12.73 .31	41.5 1.1	55.64 .41	44.0 1.0	20.24 .29	37.3 1.1	30.84 .30	14.2 1.0	11.93 .31	28.7 1.0
27.8	13.04 .31	42.6 1.1	56.05 .41	45.0 1.1	20.53 .28	36.2 0.8	31.14 .30	15.2 1.0	12.24 .31	29.7 0.9
Sept. 6.7	13.35 .29	43.7 1.0	56.46 .40	46.1 1.3	20.81 .28	35.4 0.5	31.44 .29	16.2 0.8	12.55 .30	30.6 0.8
16.7	13.64 .28	44.7 0.9	56.86 .38	47.4 1.5	21.09 .26	34.9 0.7	31.73 .28	17.0 0.6	12.85 .29	31.4 0.7
26.7	13.92 .27	45.6 0.8	57.24 .35	48.9 1.6	21.35 .24	34.8 0.3	32.01 .26	17.6 0.5	13.14 .27	32.1 0.6
Oct. 6.6	14.19 .24	46.4 0.7	57.59 .32	50.5 1.8	21.59 .23	35.1 0.5	32.27 .25	18.1 0.4	13.41 .25	32.7 0.5
16.6	14.43 .22	47.1 0.6	57.91 .29	52.3 1.8	21.82 .20	35.6 0.9	32.52 .22	18.5 0.2	13.66 .24	33.2 0.3
26.6	14.65 .19	47.7 0.5	58.20 .26	54.1 1.8	22.02 .17	36.5 1.1	32.74 .20	18.7 0.7	13.90 .21	33.5 0.3
Nov. 5.6	14.84 .16	48.2 0.5	58.46 .21	55.9 1.9	22.19 .15	37.6 1.3	32.94 .16	18.8 0.0	14.11 .18	33.8 0.2
15.5	15.00 .13	48.7 0.3	58.67 .17	57.8 1.9	22.34 .11	38.9 1.4	33.10 .14	18.8 0.1	14.29 .15	34.0 0.1
25.5	15.13 .09	49.0 0.3	58.84 .11	59.7 1.9	22.45 .08	40.3 1.4	33.24 .11	18.7 0.1	14.44 .11	34.1 0.0
Dec. 5.5	15.22 .05	49.3 0.2	58.95 .06	61.6 1.7	22.53 .05	41.7 1.5	33.35 .06	18.6 0.2	14.55 .08	34.1 0.1
15.4	15.27 .02	49.5 0.2	59.01 .00	63.3 1.6	22.58 .00	43.2 1.4	33.41 .03	18.4 0.2	14.63 .04	34.2 0.0
25.4	15.29 .03	49.7 0.1	59.01 .05	64.9 1.4	22.58 .03	44.6 1.2	33.44 .01	18.2 0.2	14.67 .01	34.2 0.1
35.4	15.26	49.8	58.96	66.3	22.55	45.8	33.43	18.0	14.66	34.1

## FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Mensæ.		$m$ Persei.		$\alpha$ Tauri. (Aldebaran.)		$\tau$ Tauri.		$\alpha$ Camelopardalis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 4 24	° ' " -80 25	h m 4 26	° ' " +42 51	h m 4 30	° ' " +16 19	h m 4 36	° ' " +22 46	h m 4 44	° ' " +66 10
Jan. 0.4	21.69 s	74.7 "	52.63 s	56.0 "	35.25 s	16.5 "	40.03 s	39.9 "	49.56 s	69.0 "
10.4	20.72 0.97	77.0 2.3	52.58 .05	57.1 1.1	35.22 .03	16.3 0.2	40.01 .02	39.9 0.1	49.44 .12	71.3 2.3
20.4	19.58 1.14	78.9 1.9	52.47 .11	58.1 1.0	35.15 .07	16.1 0.2	39.94 .07	40.1 0.1	49.22 .22	73.4 2.1
30.3	18.30 1.28	80.2 1.3	52.32 .15	58.8 0.7	35.04 .11	15.9 0.2	39.83 .11	40.2 0.1	48.91 .31	75.1 1.7
Feb. 9.3	16.92 1.38	81.0 0.8	52.13 .19	59.3 0.5	34.91 .13	15.7 0.2	39.69 .14	40.2 0.0	48.53 .38	76.4 1.3
	1.44	0.2	.23	0.2	.16	0.2	.16	0.1	.43	0.8
19.3	15.48	81.2	51.90	59.5	34.75	15.5	39.53	40.1	48.10	77.2
Mar. 1.3	14.01 1.47	80.9 0.3	51.66 .24	59.4 0.1	34.57 .18	15.3 0.2	39.34 .19	40.0 0.1	47.63 .47	77.5 0.3
11.2	12.56 1.45	80.0 0.9	51.42 .24	59.1 0.3	34.39 .18	15.1 0.2	39.15 .19	39.8 0.2	47.15 .48	77.4 0.1
21.2	11.17 1.39	78.6 1.4	51.19 .23	58.5 0.6	34.21 .18	14.9 0.2	38.97 .18	39.5 0.3	46.68 .47	76.7 0.7
31.2	9.87 1.30	76.8 1.8	50.97 .22	57.6 0.9	34.05 .16	14.8 0.1	38.80 .17	39.2 0.3	46.25 .43	75.6 1.1
	1.18	2.3	.17	1.0	.13	0.1	.14	0.3	.38	1.4
Apr. 10.1	8.69	74.5	50.80	56.6	33.92	14.7	38.66	38.9	45.87	74.2
20.1	7.65 1.04	71.8 2.7	50.67 .13	55.4 1.2	33.82 .10	14.6 0.1	38.55 .11	38.6 0.3	45.57 .30	72.4 1.8
30.1	6.79 0.86	68.8 3.0	50.59 .08	54.2 1.2	33.76 .06	14.7 0.1	38.49 .06	38.3 0.3	45.36 .21	70.4 2.0
May 10.1	6.12 0.67	65.6 3.2	50.58 .01	53.0 1.2	33.75 .01	14.9 0.2	38.47 .02	38.1 0.2	45.25 .11	68.2 2.2
20.0	5.65 0.47	62.2 3.4	50.62 .04	51.8 1.2	33.79 .04	15.2 0.3	38.50 .03	38.0 0.1	45.24 .01	65.9 2.3
	0.24	3.5	.10	1.1	.08	0.4	.08	0.1	.09	2.3
30.0	5.41	58.7	50.72	50.7	33.87	15.6	38.58	38.1	45.33	63.6
June 9.0	5.39 0.02	55.1 3.6	50.88 .16	49.7 1.0	34.00 .13	16.2 0.6	38.71 .13	38.3 0.2	45.53 .20	61.5 2.1
19.0	5.60 0.21	51.6 3.5	51.10 .22	49.0 0.7	34.16 .16	16.9 0.7	38.88 .17	38.6 0.3	45.82 .29	59.5 2.0
28.9	6.02 0.42	48.3 3.3	51.36 .26	48.4 0.6	34.37 .21	17.7 0.8	39.09 .21	39.0 0.4	46.20 .38	57.7 1.8
July 8.9	6.65 0.63	45.2 3.1	51.66 .30	48.0 0.4	34.61 .24	18.6 0.9	39.33 .24	39.6 0.6	46.66 .46	56.1 1.6
	0.81	2.8	.34	0.1	.26	1.1	.27	0.7	.52	1.2
18.9	7.46	42.4	52.00	47.9	34.87	19.7	39.60	40.3	47.18	54.9
28.9	8.45 0.99	40.0 2.4	52.36 .36	48.0 0.1	35.15 .28	20.7 1.0	39.89 .29	41.1 0.8	47.76 .58	53.9 1.0
Aug. 7.8	9.57 1.12	38.1 1.9	52.73 .37	48.3 0.3	35.45 .30	21.7 1.0	40.19 .30	41.9 0.8	48.38 .62	53.3 0.6
17.8	10.79 1.22	36.7 1.4	53.12 .39	48.8 0.5	35.75 .30	22.7 1.0	40.50 .31	42.8 0.9	49.03 .65	53.1 0.2
27.8	12.08 1.29	35.9 0.8	53.51 .39	49.5 0.7	36.05 .30	23.7 1.0	40.82 .32	43.6 0.8	49.69 .66	53.2 0.1
	1.31	0.1	.39	0.8	.31	0.9	.32	0.9	.67	0.5
Sept. 6.7	13.39	35.8	53.90	50.3	36.36	24.6	41.14	44.5	50.36	53.7
16.7	14.68 1.29	36.2 0.4	54.28 .38	51.4 1.1	36.65 .29	25.3 0.7	41.45 .31	45.2 0.7	51.03 .67	54.5 0.8
26.7	15.91 1.23	37.3 1.1	54.64 .36	52.5 1.1	36.94 .29	25.9 0.6	41.75 .30	45.9 0.7	51.67 .64	55.7 1.2
Oct. 6.7	17.03 1.12	38.9 1.6	54.99 .35	53.7 1.2	37.21 .27	26.4 0.5	42.03 .28	46.5 0.6	52.30 .63	57.2 1.5
16.6	18.01 0.98	41.1 2.2	55.32 .33	55.1 1.4	37.47 .26	26.7 0.3	42.30 .27	47.1 0.6	52.88 .58	59.0 1.8
	0.80	2.6	.30	1.4	.23	0.2	.25	0.4	.54	2.0
26.6	18.81	43.7	55.62	56.5	37.70	26.9	42.55	47.5	53.42	61.0
Nov. 5.6	19.40 0.59	46.7 3.0	55.89 .27	58.0 1.5	37.92 .22	27.0 0.1	42.78 .23	47.9 0.4	53.91 .49	63.2 2.2
15.5	19.76 0.36	49.9 3.2	56.12 .23	59.5 1.5	38.10 .18	26.9 0.1	42.98 .20	48.2 0.3	54.33 .42	65.7 2.5
25.5	19.86 0.10	53.2 3.3	56.31 .19	61.0 1.5	38.26 .16	26.8 0.1	43.15 .17	48.5 0.3	54.66 .33	68.3 2.6
Dec. 5.5	19.71 0.15	56.5 3.3	56.46 .15	62.5 1.5	38.38 .12	26.7 0.1	43.29 .14	48.8 0.2	54.91 .25	71.0 2.7
	0.40	3.1	.09	1.5	.08	0.2	.09	0.2	.16	2.7
15.5	19.31	59.6	56.55	64.0	38.46	26.5	43.38	49.0	55.07	73.7
25.4	18.68 0.63	62.5 2.9	56.59 .04	65.4 1.4	38.50 .04	26.4 0.1	43.43 .05	49.2 0.2	55.12 .05	76.3 2.6
35.4	17.83 0.85	65.1 2.6	56.58 .01	66.7 1.3	38.51 .01	26.2 0.2	43.44 .01	49.4 0.2	55.07 .05	78.8 2.5

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♌ Tauri.		♊ Aurigæ.		♋ Aurigæ.		♌ Orionis.		♍ Eridani.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 4 45	° ' " +18 40	h m 4 50	° ' " +33 1	h m 4 55	° ' " +40 56	h m 4 59	° ' " +15 16	h m 5 3	° ' " - 5 12
Jan. 0.4	56.27 s	50.1 "	56.55 s	6.6 "	59.06 s	24.3 "	15.59 s	24.4 "	17.07 s	31.1 "
10.4	56.25 .02	50.1 0.0	56.53 .02	7.3 0.7	59.04 .02	25.5 1.2	15.58 .01	24.1 0.3	17.06 .01	32.4 1.3
20.4	56.19 .06	50.0 0.1	56.47 .06	7.9 0.6	58.97 .07	26.5 1.0	15.54 .04	23.9 0.2	17.01 .05	33.6 1.2
30.4	56.09 .10	49.9 0.1	56.36 .11	8.4 0.5	58.84 .13	27.3 0.8	15.45 .09	23.7 0.2	16.91 .10	34.6 1.0
Feb. 9.3	55.96 .13	49.8 0.1	56.21 .15	8.8 0.4	58.67 .17	28.0 0.7	15.32 .13	23.5 0.2	16.78 .13	35.3 0.7
19.3	55.80 .16	49.7 0.1	56.03 .18	9.0 0.2	58.47 .20	28.4 0.4	15.17 .15	23.4 0.1	16.63 .15	35.9 0.6
Mar. 1.3	55.62 .18	49.6 0.1	55.82 .21	9.0 0.0	58.24 .23	28.5 0.1	15.00 .17	23.3 0.1	16.46 .17	36.2 0.3
11.2	55.44 .18	49.4 0.2	55.61 .21	8.9 0.1	58.01 .23	28.4 0.1	14.81 .19	23.2 0.1	16.28 .18	36.3 0.1
21.2	55.26 .18	49.2 0.2	55.40 .21	8.6 0.3	57.77 .24	28.1 0.3	14.63 .18	23.1 0.1	16.09 .19	36.2 0.1
31.2	55.09 .17	49.1 0.1	55.21 .19	8.1 0.5	57.55 .22	27.5 0.6	14.46 .17	23.0 0.1	15.92 .17	35.8 0.4
Apr. 10.2	54.95 .14	48.9 0.2	55.05 .16	8.1 0.6	57.36 .19	26.7 0.8	14.32 .14	23.0 0.0	15.77 .15	35.3 0.5
20.1	54.84 .11	48.8 0.1	54.92 .13	7.5 0.7	57.21 .15	26.7 0.9	14.20 .12	23.0 0.0	15.65 .12	34.5 0.8
30.1	54.77 .07	48.7 0.1	54.83 .09	6.8 0.7	57.11 .10	25.8 1.0	14.12 .08	23.0 0.1	15.56 .09	34.5 1.0
May 10.1	54.74 .03	48.7 0.1	54.80 .03	6.1 0.7	57.11 .05	24.8 1.1	14.12 .04	23.1 0.3	15.56 .05	33.5 1.3
20.1	54.76 .02	48.8 0.1	54.82 .02	5.4 0.6	57.06 .01	23.7 1.1	14.08 .01	23.4 0.3	15.51 .01	32.2 1.4
30.0	54.83 .07	48.9 0.3	54.89 .07	4.8 0.6	57.07 .07	22.6 1.0	14.09 .05	23.7 0.4	15.50 .04	30.8 1.6
June 9.0	54.94 .11	49.2 0.4	54.89 .12	4.2 0.4	57.14 .12	21.6 0.9	14.14 .10	24.1 0.6	15.54 .08	29.2 1.7
19.0	55.10 .16	49.6 0.5	55.01 .17	3.8 0.4	57.26 .18	20.7 0.8	14.24 .14	24.7 0.7	15.62 .12	27.5 1.8
28.9	55.29 .19	50.1 0.7	55.18 .21	3.4 0.2	57.44 .23	19.9 0.7	14.38 .18	25.4 0.8	15.74 .16	25.7 1.8
July 8.9	55.52 .23	50.8 0.7	55.39 .25	3.2 0.0	57.67 .27	19.2 0.4	14.56 .22	26.2 0.8	15.90 .19	23.9 1.9
18.9	55.78 .26	51.5 0.9	55.64 .28	3.2 0.1	57.94 .30	18.8 0.3	14.78 .24	27.0 0.9	16.09 .22	22.0 1.8
Aug. 7.8	55.78 .28	52.4 0.8	55.92 .31	3.3 0.3	58.24 .33	18.5 0.1	15.02 .26	27.9 1.0	16.31 .25	20.2 1.8
17.8	56.06 .29	53.2 0.9	56.23 .33	3.6 0.4	58.57 .35	18.4 0.0	15.28 .28	28.9 0.9	16.56 .26	18.4 1.6
27.8	56.35 .30	54.1 0.9	56.56 .34	4.0 0.5	58.92 .37	18.4 0.3	15.56 .30	29.8 0.9	16.82 .28	16.8 1.3
7.8	56.65 .31	55.0 0.9	56.90 .34	4.5 0.6	59.29 .38	18.7 0.4	15.86 .30	30.7 0.8	17.10 .28	15.5 1.1
17.8	56.96 .31	55.9 0.7	57.24 .34	5.1 0.6	59.67 .38	19.1 0.5	16.16 .30	31.5 0.7	17.38 .28	14.4 0.8
Sept. 6.8	57.27 .30	56.6 0.7	57.58 .35	5.7 0.7	60.05 .37	19.6 0.7	16.46 .30	32.2 0.6	17.66 .29	13.6 0.5
16.7	57.57 .30	57.3 0.6	57.93 .33	6.4 0.7	60.42 .37	20.3 0.8	16.76 .29	32.8 0.4	17.95 .28	13.1 0.2
26.7	57.87 .28	57.9 0.4	58.26 .32	7.1 0.8	60.79 .36	21.1 0.8	17.05 .29	33.2 0.3	18.23 .27	12.9 0.2
Oct. 6.7	58.15 .27	58.3 0.3	58.58 .31	7.9 0.8	61.15 .35	21.9 1.0	17.34 .27	33.5 0.2	18.50 .25	13.1 0.6
16.6	58.42 .25	58.6 0.3	58.89 .29	8.7 0.8	61.50 .32	22.9 1.1	17.61 .25	33.7 0.0	18.75 .25	13.7 0.8
Nov. 5.6	58.67 .23	58.9 0.1	59.18 .26	9.5 0.8	61.82 .29	24.0 1.1	17.86 .24	33.7 0.1	19.00 .22	14.5 1.1
15.6	58.90 .20	59.0 0.0	59.44 .23	10.3 0.8	62.11 .26	25.1 1.2	18.10 .21	33.6 0.2	19.22 .19	15.6 1.3
25.5	59.10 .18	59.0 0.0	59.67 .20	11.1 0.9	62.37 .23	26.3 1.3	18.31 .18	33.4 0.3	19.41 .17	16.9 1.4
Dec. 5.5	59.28 .14	59.0 0.0	59.87 .16	12.0 0.8	62.60 .18	27.6 1.3	18.49 .15	33.1 0.3	19.58 .14	18.3 1.5
15.5	59.42 .10	59.0 0.0	60.03 .12	12.8 0.9	62.78 .13	28.9 1.3	18.64 .11	32.8 0.2	19.72 .10	19.8 1.5
25.5	59.52 .06	59.0 0.1	60.15 .07	13.7 0.8	62.91 .08	30.2 1.3	18.75 .07	32.6 0.3	19.82 .06	21.3 1.5
35.4	59.58 .01	58.9 0.0	60.22 .02	14.5 0.8	62.99 .02	31.5 1.2	18.82 .03	32.3 0.3	19.88 .01	22.8 1.4
	59.59	58.9	60.24	15.3	63.01	32.7	18.85	32.0	19.89	24.2

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Aurigæ. ( <i>Capella</i> .)			$\beta$ Orionis. ( <i>Rigel</i> .)			$\tau$ Orionis.			$\beta$ Tauri.			$\chi$ Aurigæ.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	5 9		+45 54	5 10		- 8 18	5 13		- 6 56	5 20		+28 31	5 26		+32 7
	s	"	"	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.4	49.68	.00	12.4	4.53	.01	40.1	5.88	.01	48.8	25.16	.02	41.5	40.90	.03	21.4
10.4	49.68	.07	13.8	4.52	.06	41.6	5.87	.05	50.3	25.18	.04	42.0	40.93	.03	22.1
20.4	49.61	.12	15.1	4.46	.09	42.9	5.82	.09	51.6	25.14	.08	42.5	40.90	.03	22.7
30.4	49.49	.18	16.3	4.37	.13	44.0	5.73	.12	52.6	25.06	.12	42.9	40.82	.08	23.3
Feb. 9.3	49.31	.22	17.2	4.24	.15	44.9	5.61	.15	53.5	24.94	.16	43.2	40.69	.13	23.9
19.3	49.09	.24	17.8	4.09	.17	45.5	5.46	.17	54.1	24.78	.19	43.5	40.53	.19	24.3
Mar. 1.3	48.85	.26	18.1	3.92	.19	45.9	5.29	.19	54.5	24.59	.20	43.6	40.34	.21	24.5
11.3	48.59	.26	18.1	3.73	.18	46.0	5.10	.18	54.6	24.39	.20	43.7	40.13	.21	24.6
21.2	48.33	.25	17.9	3.55	.16	45.9	4.92	.17	54.5	24.19	.19	43.6	39.92	.20	24.5
31.2	48.08	.22	17.3	3.37	.16	45.5	4.75	.16	54.1	24.00	.17	43.4	39.72	.18	24.3
Apr. 10.2	47.86	.17	16.5	3.21	.13	44.9	4.59	.13	53.5	23.83	.15	43.0	39.54	.16	24.0
20.1	47.69	.13	15.5	3.08	.09	44.0	4.46	.10	52.7	23.68	.10	42.6	39.38	.11	23.5
30.1	47.56	.07	14.4	2.99	.06	42.8	4.36	.06	51.6	23.58	.06	42.2	39.27	.07	23.0
May 10.1	47.49	.01	13.1	2.93	.02	41.5	4.30	.02	50.4	23.52	.01	41.8	39.20	.01	22.4
20.1	47.48	.05	11.8	2.91	.03	40.0	4.28	.03	48.9	23.51	.04	41.4	39.19	.03	21.8
30.0	47.53	.11	10.5	2.94	.07	38.3	4.31	.07	47.3	23.55	.09	41.1	39.22	.08	21.3
June 9.0	47.64	.17	9.2	3.01	.12	36.4	4.38	.11	45.5	23.64	.13	40.8	39.30	.13	20.8
19.0	47.81	.23	8.1	3.13	.15	34.4	4.49	.15	43.6	23.77	.18	40.6	39.43	.18	20.4
29.0	48.04	.27	7.1	3.28	.18	32.4	4.64	.18	41.7	23.95	.21	40.6	39.61	.22	20.1
July 8.9	48.31	.31	6.3	3.46	.22	30.4	4.82	.21	39.8	24.16	.25	40.6	39.83	.25	19.9
18.9	48.62	.35	5.6	3.68	.24	28.5	5.03	.24	37.9	24.41	.28	40.8	40.08	.28	19.8
28.9	48.97	.37	5.2	3.92	.25	26.7	5.27	.26	36.1	24.69	.29	41.0	40.36	.30	19.9
Aug. 7.8	49.34	.39	4.9	4.17	.27	25.0	5.53	.27	34.5	24.98	.31	41.3	40.66	.32	20.0
17.8	49.73	.40	4.9	4.44	.29	23.6	5.80	.28	33.1	25.29	.32	41.7	40.98	.33	20.2
27.8	50.13	.41	5.0	4.73	.28	22.4	6.08	.29	31.9	25.61	.33	42.1	41.31	.34	20.5
Sept. 6.8	50.54	.41	5.3	5.01	.29	21.6	6.37	.28	31.1	25.94	.33	42.5	41.65	.34	20.8
16.7	50.95	.40	5.8	5.30	.28	21.1	6.65	.28	30.6	26.27	.33	42.9	41.99	.34	21.1
26.7	51.35	.39	6.5	5.58	.27	21.0	6.93	.28	30.5	26.60	.32	43.4	42.33	.33	21.5
Oct. 6.7	51.74	.38	7.3	5.85	.26	21.2	7.21	.26	30.7	26.92	.31	43.8	42.66	.33	21.9
16.7	52.12	.36	8.2	6.11	.25	21.8	7.47	.24	31.3	27.23	.30	44.2	42.99	.31	22.4
26.6	52.48	.33	9.3	6.36	.23	22.8	7.71	.23	32.2	27.53	.28	44.6	43.30	.29	22.9
Nov. 5.6	52.81	.30	10.6	6.59	.20	24.0	7.94	.21	33.4	27.81	.25	44.9	43.59	.27	23.4
15.6	53.11	.26	11.9	6.79	.17	25.5	8.15	.18	34.8	28.06	.22	45.3	43.86	.24	23.9
25.5	53.37	.21	13.3	6.96	.14	27.1	8.33	.14	36.3	28.28	.19	45.8	44.10	.20	24.5
Dec. 5.5	53.58	.16	14.8	7.10	.10	28.8	8.47	.11	37.9	28.47	.15	46.2	44.30	.16	25.1
15.5	53.74	.10	16.4	7.20	.07	30.5	8.58	.07	39.6	28.62	.10	46.7	44.46	.11	25.8
25.5	53.84	.03	18.0	7.27	.02	32.2	8.65	.02	41.2	28.72	.05	47.2	44.57	.06	26.5
35.4	53.87		19.5	7.29		33.7	8.67		42.7	28.77		47.7	44.63		27.2

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Orionis.		Groombridge 966.		α Leporis.		ε Orionis.		Groombridge 944.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 5 27	° ' " - 0 21	h m 5 27	° ' " +74 58	h m 5 28	° ' " -17 53	h m 5 31	° ' " - 1 15	h m 5 31	° ' " +85 8
	s	"	s	"	s	"	s	"	s	"
Jan. 0.5	15.73	70.8	19.96	59.4	38.31	27.8	30.09	46.6	76.07	66.4
10.4	15.74	71.9	19.87	62.2	38.30	29.8	30.11	47.8	75.66	69.6
20.4	15.71	72.9	19.62	64.9	38.25	31.6	30.08	48.9	74.76	72.6
30.4	15.64	73.8	19.22	67.2	38.16	33.2	30.01	49.8	73.40	75.3
Feb. 9.3	15.53	74.5	18.69	69.2	38.03	34.4	29.90	50.5	71.64	77.5
19.3	15.39	75.0	18.04	70.7	37.87	35.3	29.76	51.1	69.55	79.3
Mar. 1.3	15.22	75.3	17.32	71.7	37.69	35.9	29.59	51.4	67.23	80.5
11.3	15.04	75.4	16.55	72.1	37.49	36.1	29.41	51.6	64.78	81.1
21.2	14.86	75.4	15.78	72.0	37.29	36.0	29.23	51.5	62.31	81.0
31.2	14.69	75.2	15.03	71.4	37.09	35.5	29.05	51.3	59.91	80.4
Apr. 10.2	14.53	74.8	14.35	70.3	36.91	34.8	28.89	50.9	57.69	79.3
20.2	14.39	74.2	13.76	68.7	36.76	33.7	28.76	50.3	55.72	77.6
30.1	14.29	73.4	13.28	66.7	36.64	32.3	28.65	49.5	54.09	75.5
May 10.1	14.23	73.5	12.94	64.5	36.55	30.7	28.58	48.5	52.86	73.1
20.1	14.20	71.4	12.75	62.1	36.51	28.8	28.56	47.4	52.05	70.4
30.0	14.22	70.1	12.71	59.5	36.51	26.7	28.57	46.1	51.70	67.5
June 9.0	14.29	68.7	12.83	56.9	36.56	24.5	28.63	44.7	51.82	64.6
19.0	14.39	67.3	13.09	54.4	36.65	22.1	28.73	43.2	52.39	61.7
29.0	14.53	65.7	13.50	52.0	36.78	19.7	28.86	41.6	53.41	58.9
July 8.9	14.70	64.1	14.05	49.8	36.94	17.3	29.03	40.0	54.84	56.4
18.9	14.91	62.6	14.71	47.8	37.14	15.0	29.23	38.4	56.65	54.0
28.9	15.14	61.1	15.48	46.1	37.36	12.8	29.46	36.9	58.79	52.0
Aug. 7.9	15.39	59.7	16.33	44.7	37.61	10.9	29.71	35.5	61.22	50.3
17.8	15.66	58.5	17.26	43.6	37.87	9.2	29.98	34.2	63.88	49.0
27.8	15.94	57.5	18.23	43.0	38.15	7.9	30.25	33.2	66.72	48.1
Sept. 6.8	16.22	56.7	19.24	42.7	38.44	7.0	30.53	32.4	69.69	47.6
16.7	16.50	56.2	20.27	42.8	38.73	6.4	30.82	32.0	72.73	47.6
26.7	16.79	56.1	21.30	43.4	39.02	6.4	31.10	31.8	75.78	48.1
Oct. 6.7	17.07	56.2	22.31	44.3	39.30	6.8	31.38	31.9	78.79	49.0
16.7	17.34	56.6	23.28	45.6	39.58	7.6	31.65	32.4	81.68	50.4
26.6	17.60	57.3	24.20	47.3	39.84	8.8	31.91	33.1	84.40	52.2
Nov. 5.6	17.84	58.2	25.04	49.4	40.08	10.4	32.16	34.1	86.88	54.4
15.6	18.06	59.3	25.79	51.7	40.29	12.3	32.38	35.2	89.06	56.9
25.6	18.25	60.5	26.42	54.3	40.48	14.4	32.58	36.5	90.87	59.8
Dec. 5.5	18.41	61.8	26.92	57.2	40.63	16.6	32.74	37.9	92.27	62.9
15.5	18.54	63.1	27.28	60.1	40.75	18.8	32.87	39.3	93.21	66.2
25.5	18.63	64.4	27.47	63.1	40.82	21.1	32.96	40.6	93.66	69.5
35.4	18.67	65.6	27.50	66.0	40.84	23.2	33.01	41.9	93.59	72.8

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Columbæ.			$\kappa$ Orionis.			$\delta$ Doradus.			$\nu$ Aurigæ.			$\alpha$ Orionis.		
	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°
	5	36	-34 7	5	43	-94 1	5	44	-65 45	5	45	+39 7	5	50	+7 23
	s	"	"	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.5	17.83		34.4	21.27		76.1	39.44		84.1	3.19		14.5	8.64		18.1
		.02	2.6		.02	1.7		.18			.04	1.2		.04	0.7
10.4	17.81		37.0	21.29		77.8	39.26		87.3	3.23		15.7	8.68		17.4
		.08	2.4		.02	1.5		.28			.02	1.0		.01	0.7
20.4	17.73		39.4	21.27		79.3	38.98		90.2	3.21		16.7	8.67		16.7
		.12	2.1		.07	1.3		.36			.07	1.0		.05	0.6
30.4	17.61		41.5	21.20		80.6	38.62		92.8	3.14		17.7	8.62		16.1
		.17	1.6		.11	1.0		.43			.12	0.9		.10	0.4
Feb. 9.4	17.44		43.1	21.09		81.6	38.19		94.8	3.02		18.6	8.52		15.7
		.20	1.3		.15	0.8		.49			.17	0.8		.13	0.3
19.3	17.24		44.4	20.94		82.4	37.70		96.4	2.85		19.4	8.39		15.4
		.23	0.8		.16	0.6		.54			.20	0.5		.15	0.2
Mar. 1.3	17.01		45.2	20.78		83.0	37.16		97.5	2.65		19.9	8.24		15.2
		.24	0.4		.19	0.2		.57			.23	0.3		.18	0.1
11.3	16.77		45.6	20.59		83.2	36.59		98.0	2.42		20.2	8.06		15.1
		.25	0.1		.19	0.0		.57			.23	0.0		.18	0.1
21.2	16.52		45.5	20.40		83.2	36.02		97.9	2.19		20.2	7.88		15.2
		.24	0.6		.18	0.3		.56			.23	0.1		.18	0.1
31.2	16.28		44.9	20.22		82.9	35.46		97.3	1.96		20.1	7.70		15.3
		.22	0.9		.17	0.5		.54			.21	0.4		.16	0.2
Apr. 10.2	16.06		44.0	20.05		82.4	34.92		96.2	1.75		19.7	7.54		15.5
		.20	1.4		.15	0.8		.49			.18	0.6		.14	0.4
20.2	15.86		42.6	19.90		81.6	34.43		94.6	1.57		19.1	7.40		15.9
		.16	1.8		.12	1.0		.44			.14	0.7		.12	0.4
30.1	15.70		40.8	19.78		80.6	33.99		92.5	1.43		18.4	7.28		16.3
		.13	2.1		.08	1.3		.38			.09	0.8		.07	0.6
May 10.1	15.57		38.7	19.70		79.3	33.61		90.0	1.34		17.6	7.21		16.9
		.08	2.4		.05	1.5		.30			.04	0.9		.04	0.6
20.1	15.49		36.3	19.65		77.8	33.31		87.2	1.30		16.7	7.17		17.5
		.03	2.6		.00	1.7		.21			.01	0.9		.00	0.8
30.1	15.46		33.7	19.65		76.1	33.10		84.1	1.31		15.8	7.17		18.3
		.02	2.9		.04	1.8		.13			.07	0.9		.05	0.9
June 9.0	15.48		30.8	19.69		74.3	32.97		80.8	1.38		14.9	7.22		19.2
		.06	2.9		.08	1.9		.03			.12	0.9		.09	1.0
19.0	15.54		27.9	19.77		72.4	32.94		77.3	1.50		14.0	7.31		20.2
		.11	3.0		.12	2.0		.06			.16	0.7		.13	1.1
29.0	15.65		24.9	19.89		70.4	33.00		73.8	1.66		13.3	7.44		21.3
		.15	3.0		.15	2.0		.15			.22	0.7		.16	1.1
July 8.9	15.80		21.9	20.04		68.4	33.15		70.3	1.88		12.6	7.60		22.4
		.19	2.9		.19	2.0		.23			.25	0.5		.19	1.1
18.9	15.99		19.0	20.23		66.4	33.38		67.0	2.13		12.1	7.79		23.5
		.23	2.6		.21	1.8		.31			.29	0.5		.22	1.1
28.9	16.22		16.4	20.44		64.6	33.69		63.9	2.42		11.6	8.01		24.6
		.25	2.4		.24	1.7		.39			.31	0.3		.24	1.0
Aug. 7.9	16.47		14.0	20.68		62.9	34.08		61.2	2.73		11.3	8.25		25.6
		.28	2.0		.26	1.5		.45			.33	0.2		.26	0.9
17.8	16.75		12.0	20.94		61.4	34.53		58.8	3.06		11.1	8.51		26.5
		.30	1.6		.27	1.2		.50			.35	0.1		.28	0.8
27.8	17.05		10.4	21.21		60.2	35.03		57.0	3.41		11.0	8.79		27.3
		.31	1.1		.28	0.9		.53			.37	0.1		.28	0.6
Sept. 6.8	17.36		9.3	21.49		59.3	35.56		55.7	3.78		11.1	9.07		27.9
		.32	0.6		.28	0.5		.56			.37	0.1		.29	0.3
16.8	17.68		8.7	21.77		58.8	36.12		55.0	4.15		11.2	9.36		28.2
		.32	0.0		.29	0.1		.57			.37	0.2		.29	0.2
26.7	18.00		8.7	22.06		58.7	36.69		55.0	4.52		11.4	9.65		28.4
		.31	0.5		.28	0.3		.56			.37	0.3		.29	0.1
Oct. 6.7	18.31		9.2	22.34		59.0	37.25		55.7	4.89		11.7	9.94		28.3
		.30	1.1		.27	0.6		.53			.36	0.5		.29	0.3
16.7	18.61		10.3	22.61		59.6	37.78		57.0	5.25		12.2	10.23		28.0
		.29	1.6		.27	1.0		.49			.35	0.5		.27	0.5
26.6	18.90		11.9	22.88		60.6	38.27		58.9	5.60		12.7	10.50		27.5
		.26	2.1		.25	1.3		.44			.33	0.6		.26	0.7
Nov. 5.6	19.16		14.0	23.13		61.9	38.71		61.3	5.93		13.3	10.76		26.8
		.23	2.4		.23	1.5		.37			.31	0.8		.25	0.8
15.6	19.39		16.4	23.36		63.4	39.08		64.2	6.24		14.1	11.01		26.0
		.19	2.7		.20	1.7		.28			.28	0.8		.22	0.9
25.6	19.58		19.1	23.56		65.1	39.36		67.4	6.52		14.9	11.23		25.1
		.16	2.9		.17	1.9		.19			.23	1.0		.19	0.9
Dec. 5.5	19.74		22.0	23.73		67.0	39.55		70.8	6.75		15.9	11.42		24.2
		.11	2.9		.13	1.9		.09			.19	1.0		.15	0.9
15.5	19.85		24.9	23.86		68.9	39.64		74.3	6.94		16.9	11.57		23.3
		.06	2.9		.10	1.8		.02			.14	1.1		.12	0.9
25.5	19.91		27.8	23.96		70.7	39.62		77.8	7.08		18.0	11.69		22.4
		.01	2.8		.06	1.8		.12			.09	1.1		.07	0.9
35.5	19.92		30.6	24.02		72.5	39.50		81.2	7.17		19.1	11.76		21.5



# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Aurigæ.		$\theta$ Aurigæ.		$\nu$ Orionis.		22 Camelop. (H.).		$\gamma$ Geminorum.		
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	
	h m 5 52	° ' " +44 56	h m 5 53	° ' " +37 12	h m 6 2	° ' " +14 46	h m 6 8	° ' " +69 20	h m 6 9	° ' " +22 31	
	s	"	s	"	s	"	s	"	s	"	
Jan. 0.5	43.11	.05 15.1	23.31	.05 19.3	16.17	.06 42.1	37.97	.07 68.9	16.31	.06 57.7	
10.4	43.16	.01 16.6	23.36	.01 20.3	16.23	.06 41.8	.03 38.04	.07 71.6	.06 16.37	.01 57.8	
20.4	43.15	.01 18.0	23.35	.01 21.3	16.23	.00 41.5	.03 37.99	.05 74.2	.02 16.39	.01 57.9	
30.4	43.07	.08 19.3	23.29	.06 22.3	16.19	.04 41.3	.02 37.81	.18 76.7	.04 16.35	.02 58.1	
Feb. 9.4	42.94	.13 20.5	23.18	.11 23.1	16.11	.08 41.2	.01 37.52	.29 78.8	.08 16.27	.03 58.4	
		.18 0.9		.16 0.7		.13 0.1		.39 1.8		.13 0.3	
	19.3	42.76	21.4	23.02	23.8	15.98	41.1	37.13	80.6	16.14	58.7
Mar. 1.3	42.54	.22 22.1	.07 22.83	.19 24.4	.06 15.83	.15 41.1	.00 36.66	.47 82.0	1.4 15.99	.15 58.9	.02 0.2
		.25 0.5		.21 0.3		.17 0.1		.52 0.9		.18 0.2	
11.3	42.29	.26 22.6	.01 22.62	.23 24.7	.17 15.66	.19 41.2	.00 36.14	.55 82.9	0.5 15.81	.19 59.1	.01 0.1
		.26 0.1		.23 0.1		.18 0.1		.55 0.1		.19 0.1	
21.3	42.03	.23 22.7	.01 22.39	.21 24.8	.17 15.47	.18 41.2	.01 35.59	.55 83.4	0.1 15.62	.19 59.2	.01 0.1
		.23 0.4		.21 0.3		.17 0.2		.52 0.6		.18 0.0	
31.2	41.78	.25 22.6	.04 22.17	.21 24.7	.17 15.29	.17 41.3	.02 35.04	.52 83.3	0.6 15.43	.18 59.3	.00 0.0
Apr. 10.2	41.55	.21 22.2	.07 21.96	.18 24.4	.15 15.12	.15 41.5	.01 34.52	.48 82.7	1.0 15.25	.16 59.3	.00 0.0
		.21 0.7		.18 0.4		.15 0.1		.48 1.0		.16 0.0	
20.2	41.34	.16 21.5	.09 21.78	.14 24.0	.06 14.97	.12 41.6	.02 34.04	.40 81.7	1.4 15.09	.13 59.3	.00 0.0
		.16 0.9		.14 0.6		.12 0.2		.40 1.4		.13 0.0	
30.1	41.18	.12 20.6	.09 21.64	.09 23.4	.08 14.85	.08 41.8	.03 33.64	.31 80.3	1.8 14.96	.09 59.3	.01 0.1
May 10.1	41.06	.06 19.6	.10 21.55	.07 22.7	.08 14.77	.08 42.1	.03 33.33	.22 78.5	2.0 14.87	.05 59.2	.00 0.0
		.06 1.2		.05 0.8		.05 0.3		.22 2.0		.05 0.0	
20.1	41.00	.00 18.4	.00 21.50	.08 21.9	.08 14.72	.04 42.4	.10 33.11	.10 76.5	2.2 14.82	.01 59.2	.00 0.0
	30.1	41.00	17.2	21.50	21.1	14.72	42.8	33.01	74.3	14.81	59.2
June 9.0	41.06	.06 16.0	.06 21.56	.08 20.3	.04 14.76	.04 43.2	.00 33.01	.00 71.9	2.4 14.85	.04 59.2	.00 0.0
		.12 1.2		.11 0.8		.08 0.6		.12 2.4		.08 0.1	
19.0	41.18	.12 14.8	.11 21.67	.08 19.5	.08 14.84	.08 43.8	.12 33.13	.12 69.5	2.4 14.93	.12 59.3	.01 0.1
		.17 1.1		.15 0.7		.12 0.6		.23 2.4		.12 0.1	
29.0	41.35	.22 13.7	.20 21.82	.16 18.8	.16 14.96	.16 44.4	.23 33.36	.31 67.1	2.3 15.05	.16 59.4	.01 0.1
July 9.0	41.57	.26 12.7	.24 22.02	.05 18.2	.19 15.12	.07 45.0	.42 33.68	.42 64.8	2.1 15.21	.20 59.5	.02 0.2
	18.9	41.83	11.8	22.26	17.7	15.31	45.7	34.10	62.7	15.41	59.7
		.30 0.8		.27 0.4		.22 0.7		.51 1.9		.22 0.3	
28.9	42.13	.33 11.0	.30 22.53	.03 17.3	.25 15.53	.25 46.4	.58 34.61	.58 60.8	1.7 15.63	.25 60.0	.02 0.2
		.33 0.6		.30 0.3		.25 0.6		.58 1.7		.25 0.3	
Aug. 7.9	42.46	.36 10.4	.34 22.83	.02 17.0	.26 15.78	.26 47.0	.64 35.19	.64 59.1	1.5 15.88	.27 60.2	.03 0.3
		.36 0.3		.34 0.2		.26 0.6		.64 1.5		.27 0.3	
17.8	42.82	.38 9.9	.32 23.15	.01 16.8	.27 16.04	.27 47.6	.69 35.83	.69 57.6	1.1 16.15	.29 60.5	.02 0.2
		.38 0.2		.35 0.0		.29 0.4		.73 0.8		.30 0.1	
27.8	43.20	.39 9.6	.35 23.49	.00 16.7	.29 16.31	.29 48.1	.73 36.52	.73 56.5	0.8 16.44	.30 60.7	.01 0.1
Sept. 6.8	43.59	.40 9.4	.36 23.84	.00 16.7	.30 16.60	.30 48.5	.76 37.25	.76 55.7	0.5 16.74	.31 60.8	.01 0.1
		.40 0.0		.36 0.0		.30 0.2		.76 0.5		.31 0.1	
16.8	43.99	.41 9.4	.37 24.20	.01 16.7	.30 16.90	.30 48.7	.77 38.01	.77 55.2	0.1 17.05	.31 60.9	.00 0.0
		.41 0.2		.37 0.1		.30 0.1		.77 0.1		.31 0.0	
26.7	44.40	.40 9.6	.36 24.57	.02 16.8	.30 17.20	.30 48.8	.78 38.78	.78 55.1	0.2 17.36	.32 60.9	.00 0.0
		.40 0.3		.36 0.2		.30 0.2		.78 0.2		.32 0.0	
Oct. 6.7	44.80	.40 9.9	.36 24.93	.03 17.0	.30 17.50	.30 48.7	.77 39.56	.77 55.3	0.6 17.68	.31 60.9	.01 0.1
		.40 0.4		.36 0.3		.30 0.3		.77 0.6		.31 0.1	
16.7	45.20	.38 10.3	.35 25.29	.04 17.3	.29 17.80	.29 48.5	.74 40.33	.74 55.9	1.0 17.99	.31 60.8	.02 0.2
	26.7	45.58	10.9	25.64	17.7	18.09	48.2	41.07	56.9	18.30	60.6
		.37 0.8		.33 0.5		.28 0.5		.71 1.3		.30 0.2	
Nov. 5.6	45.95	.34 11.7	.30 25.97	.06 18.2	.26 18.37	.26 47.7	.65 41.78	.65 58.2	1.7 18.60	.28 60.4	.02 0.2
		.34 0.9		.30 0.6		.26 0.6		.65 1.7		.28 0.2	
15.6	46.29	.31 12.6	.28 26.27	.08 18.8	.24 18.63	.24 47.2	.59 42.43	.59 59.9	2.0 18.88	.25 60.2	.02 0.2
		.31 1.1		.25 0.8		.21 0.5		.59 2.0		.25 0.2	
25.6	46.60	.28 13.7	.25 26.55	.08 19.4	.21 18.87	.21 46.6	.59 43.02	.59 61.9	2.3 19.13	.23 60.0	.02 0.2
		.28 1.4		.20 0.9		.17 0.6		.40 2.3		.19 0.1	
Dec. 5.5	46.86	.22 14.9	.20 26.80	.09 20.2	.17 19.08	.17 46.1	.40 43.51	.40 64.2	2.5 19.36	.19 59.8	.01 0.1
	15.5	47.08	16.3	27.00	21.1	19.25	45.5	43.91	66.7	19.55	59.7
		.15 1.4		.14 0.9		.13 0.5		.29 2.6		.15 0.0	
25.5	47.23	.10 17.7	.10 27.14	.09 22.0	.09 19.38	.09 45.0	.16 44.20	.16 69.3	2.7 19.70	.10 59.7	.01 0.1
35.5	47.33	.10 19.1	.10 27.24	.10 23.0	.09 19.47	.09 44.6	.16 44.36	.16 72.0	2.7 19.80	.10 59.8	.01 0.1

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\mu$ Geminorum.			$\psi$ Aurigæ.			$\alpha$ Argûs. (Canopus.)			$\nu$ Geminorum.			$\gamma$ Geminorum.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.	
	h m	s		h m	s		h m	s		h m	s		h m	s	
	6 17	+22 33		6 17	+49 19		6 21	-52 38		6 23	+20 16		6 32	+16 28	
Jan. 0.5	20.51	37.0	45.02	65.0	55.15	47.8	26.90	11.7	20.82	39.0					
10.5	20.59	37.1	45.11	66.7	55.13	51.1	26.98	11.6	20.90	38.7					
20.4	20.61	37.3	45.13	68.4	55.03	54.3	27.01	11.7	20.94	38.4					
30.4	20.58	37.5	45.08	70.0	54.87	57.1	26.99	11.8	20.92	38.3					
Feb. 9.4	20.51	37.7	44.96	71.5	54.65	59.5	26.92	11.9	20.86	38.3					
19.4	20.39	38.0	44.78	72.8	54.38	61.5	26.81	12.1	20.76	38.4					
Mar. 1.3	20.24	38.3	44.55	73.8	54.06	63.0	26.66	12.3	20.62	38.5					
11.3	20.06	38.5	44.29	74.5	53.72	64.0	26.49	12.5	20.46	38.6					
21.3	19.87	38.7	44.01	75.0	53.36	64.5	26.30	12.7	20.28	38.8					
31.2	19.68	38.8	43.73	75.1	52.99	64.4	26.11	12.9	20.09	38.9					
Apr. 10.2	19.50	38.9	43.47	74.8	52.64	63.9	25.93	13.0	19.92	39.1					
20.2	19.34	38.9	43.23	74.3	52.31	62.8	25.77	13.1	19.76	39.3					
30.2	19.21	38.9	43.03	73.5	52.01	61.3	25.64	13.1	19.62	39.5					
May 10.1	19.11	38.8	42.88	72.4	51.75	59.3	25.54	13.2	19.52	39.7					
20.1	19.05	38.8	42.78	71.2	51.54	56.9	25.48	13.3	19.45	40.0					
30.1	19.03	38.8	42.74	69.8	51.39	54.2	25.46	13.4	19.42	40.2					
June 9.1	19.06	38.8	42.77	68.4	51.29	51.2	25.48	13.5	19.44	40.6					
19.0	19.14	38.8	42.85	66.9	51.25	48.0	25.55	13.7	19.49	40.9					
29.0	19.25	38.9	43.00	65.5	51.28	44.7	25.66	13.9	19.59	41.4					
July 9.0	19.41	39.0	43.20	64.1	51.36	41.4	25.80	14.1	19.72	41.8					
18.9	19.59	39.2	43.45	62.8	51.50	38.1	25.98	14.4	19.89	42.2					
28.9	19.81	39.4	43.74	61.6	51.70	34.9	26.19	14.7	20.08	42.7					
Aug. 7.9	20.06	39.6	44.07	60.6	51.95	32.0	26.42	14.9	20.31	43.1					
17.9	20.32	39.8	44.44	59.7	52.25	29.5	26.68	15.2	20.55	43.4					
27.8	20.60	39.9	44.83	59.0	52.58	27.4	26.95	15.4	20.81	43.7					
Sept. 6.8	20.90	40.0	45.24	58.4	52.94	25.8	27.24	15.5	21.09	43.9					
16.8	21.21	40.0	45.67	58.0	53.33	24.7	27.54	15.5	21.38	43.9					
26.8	21.52	40.0	46.10	57.9	53.73	24.3	27.85	15.5	21.68	43.9					
Oct. 6.7	21.84	39.9	46.54	57.9	54.14	24.5	28.16	15.3	21.99	43.6					
16.7	22.16	39.7	46.98	58.1	54.54	25.4	28.48	15.0	22.30	43.3					
26.7	22.47	39.5	47.41	58.5	54.93	26.9	28.79	14.7	22.60	42.8					
Nov. 5.6	22.77	39.2	47.83	59.1	55.29	28.9	29.09	14.3	22.90	42.2					
15.6	23.06	38.9	48.22	60.0	55.62	31.5	29.38	14.0	23.19	41.6					
25.6	23.32	38.7	48.58	61.1	55.90	34.4	29.64	13.6	23.45	41.0					
Dec. 5.6	23.56	38.5	48.90	62.3	56.12	37.7	29.87	13.2	23.69	40.4					
15.5	23.75	38.4	49.16	63.8	56.28	41.1	30.07	12.9	23.89	39.8					
25.5	23.91	38.3	49.36	65.4	56.38	44.6	30.24	12.7	24.06	39.3					
35.5	24.02	38.4	49.50	67.0	56.40	48.0	30.35	12.6	24.18	38.9					

# FIXED STARS, 1907.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Geminorum.		ψ Aurigæ.		α Canis Majoris. (Sirius.)		θ Geminorum.		ζ Mensæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 6 38	° ' " +25 13	h m 6 40	° ' " +43 40	h m 6 41	° ' " -16 35	h m 6 46	° ' " +34 4	h m 6 47	° ' " -80 42
Jan. 0.5	13.09	19.7	2.92	8.4	3.58	22.5	40.14	20.3	58.19	61.3
10.5	13.19	19.9	3.03	9.8	3.64	24.8	40.25	21.0	57.91	64.8
20.5	13.24	20.2	3.08	11.2	3.66	26.9	40.31	21.8	57.38	68.1
30.4	13.23	20.6	3.07	12.6	3.63	28.8	40.31	22.7	56.60	71.2
Feb. 9.4	13.17	21.0	2.99	13.9	3.55	30.4	40.25	23.6	55.62	74.0
19.4	13.06	21.5	2.85	15.1	3.43	31.7	40.14	24.4	54.45	76.4
Mar. 1.3	12.92	21.9	2.67	16.2	3.28	32.7	39.99	25.2	53.14	78.3
11.3	12.75	22.3	2.46	17.0	3.10	33.4	39.80	25.9	51.71	79.8
21.3	12.56	22.6	2.22	17.6	2.91	33.8	39.60	26.4	50.22	80.8
31.3	12.37	22.8	1.97	17.9	2.71	33.8	39.39	26.7	48.69	81.2
Apr. 10.2	12.18	22.9	1.73	17.9	2.52	33.5	39.18	26.8	47.16	81.1
20.2	12.01	23.0	1.51	17.6	2.34	32.9	38.99	26.7	45.68	80.5
30.2	11.86	23.0	1.32	17.1	2.18	32.0	38.82	26.5	44.27	79.4
May 10.1	11.75	22.9	1.17	16.4	2.05	30.8	38.69	26.2	42.97	77.9
20.1	11.67	22.8	1.06	15.6	1.96	29.4	38.60	25.7	41.80	75.9
30.1	11.64	22.6	1.01	14.6	1.90	27.8	38.56	25.2	40.80	73.5
June 9.1	11.65	22.5	1.01	13.5	1.88	25.9	38.56	24.6	39.99	70.7
19.0	11.70	22.3	1.07	12.3	1.90	23.9	38.61	23.9	39.37	67.7
29.0	11.80	22.2	1.18	11.1	1.96	21.8	38.70	23.3	38.98	64.5
July 9.0	11.94	22.1	1.33	10.0	2.05	19.6	38.84	22.6	38.82	61.2
19.0	12.11	22.0	1.54	8.9	2.18	17.5	39.02	22.0	38.89	57.9
28.9	12.31	22.0	1.78	7.8	2.34	15.4	39.23	21.4	39.19	54.7
Aug. 7.9	12.54	21.9	2.06	6.8	2.53	13.5	39.47	20.9	39.72	51.6
17.9	12.80	21.9	2.38	5.9	2.75	11.9	39.74	20.3	40.46	48.8
27.9	13.08	21.8	2.72	5.2	2.99	10.5	40.04	19.8	41.39	46.4
Sept. 6.8	13.37	21.7	3.08	4.5	3.25	9.4	40.35	19.4	42.47	44.4
16.8	13.68	21.5	3.46	3.9	3.52	8.8	40.68	19.0	43.68	43.0
26.8	14.00	21.3	3.85	3.5	3.80	8.6	41.03	18.6	44.99	42.2
Oct. 6.7	14.32	21.0	4.25	3.2	4.09	8.8	41.38	18.2	46.34	42.0
16.7	14.65	20.7	4.65	3.1	4.38	9.4	41.73	17.9	47.68	42.5
26.7	14.97	20.4	5.05	3.2	4.67	10.5	42.09	17.7	48.98	43.6
Nov. 5.7	15.29	20.1	5.44	3.4	4.95	12.0	42.44	17.5	50.17	45.3
15.6	15.60	19.7	5.82	3.8	5.22	13.8	42.78	17.5	51.22	47.5
25.6	15.88	19.5	6.17	4.4	5.47	15.9	43.09	17.6	52.09	50.2
Dec. 5.6	16.14	19.3	6.48	5.1	5.69	18.1	43.38	17.8	52.74	53.3
15.6	16.36	19.2	6.76	6.1	5.87	20.5	43.63	18.2	53.14	56.7
25.5	16.54	19.3	6.98	7.3	6.01	22.9	43.84	18.8	53.29	60.2
35.5	16.68	19.4	7.14	8.6	6.11	25.3	43.99	19.4	53.17	63.7

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Canis Majoris.		ζ Geminorum.		δ Canis Majoris.		63 Aurigæ.		γ² Volantis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m	°	h m	°	h m	°	h m	°	h m	°
	6 54	-28 50	6 58	+20 42	7 4	-26 14	7 5	+39 28	7 9	-70 20
	s	"	s	"	s	"	s	"	s	"
Jan. 0.5	59.17	46.8	36.05	20.1	37.42	46.4	16.16	15.8	36.73	53.9
10.5	59.24	49.7	36.16	19.9	37.50	49.1	16.30	16.8	36.72	57.6
20.5	59.26	52.3	36.23	19.9	37.53	51.7	16.38	17.9	36.58	61.1
30.4	59.22	54.7	36.24	20.0	37.50	54.1	16.40	19.1	36.32	64.5
Feb. 9.4	59.13	56.9	36.20	20.2	37.43	56.2	16.36	20.3	35.95	67.5
	59.00	58.7	36.11	20.5	37.31	58.0	16.26	21.5	35.48	70.2
Mar. 1.4	58.83	60.1	35.99	20.8	37.16	59.4	16.11	22.6	34.92	72.4
11.3	58.63	61.1	35.83	21.2	36.97	60.4	15.92	23.5	34.30	74.2
21.3	58.41	61.7	35.66	21.5	36.76	61.1	15.71	24.2	33.63	75.5
31.3	58.19	61.9	35.47	21.8	36.55	61.3	15.48	24.7	32.94	76.2
Apr. 10.2	57.97	61.7	35.29	22.0	36.34	61.2	15.26	24.9	32.25	76.4
20.2	57.76	61.1	35.12	22.2	36.14	60.7	15.05	24.9	31.56	76.1
30.2	57.57	60.1	34.97	22.4	35.95	59.8	14.86	24.7	30.91	75.3
May 10.2	57.41	58.7	34.85	22.5	35.79	58.5	14.70	24.3	30.31	73.9
20.1	57.28	57.0	34.76	22.6	35.66	57.0	14.59	23.7	29.77	72.1
30.1	57.19	55.0	34.72	22.7	35.57	55.1	14.52	23.0	29.30	69.8
June 9.1	57.14	52.8	34.71	22.8	35.52	53.0	14.50	22.1	28.92	67.2
19.1	57.13	50.4	34.74	22.9	35.51	50.7	14.53	21.2	28.64	64.3
29.0	57.16	47.8	34.82	23.0	35.53	48.3	14.60	20.2	28.45	61.1
July 9.0	57.24	45.2	34.93	23.1	35.60	45.7	14.73	19.2	28.38	57.8
19.0	57.35	42.5	35.07	23.2	35.70	43.2	14.89	18.2	28.41	54.4
29.0	57.49	39.9	35.25	23.3	35.84	40.7	15.09	17.2	28.55	51.1
Aug. 7.9	57.67	37.5	35.46	23.4	36.01	38.4	15.33	16.3	28.79	47.9
17.9	57.88	35.4	35.69	23.4	36.21	36.4	15.61	15.4	29.14	44.9
27.9	58.12	33.6	35.94	23.3	36.44	34.6	15.91	14.5	29.58	42.3
Sept. 6.8	58.39	32.1	36.22	23.2	36.69	33.2	16.23	13.7	30.10	40.1
16.8	58.67	31.2	36.51	23.0	36.96	32.2	16.58	13.0	30.69	38.5
26.8	58.96	30.7	36.81	22.7	37.25	31.7	16.94	12.3	31.33	37.4
Oct. 6.8	59.27	30.7	37.12	22.3	37.55	31.7	17.31	11.7	32.00	37.0
16.7	59.58	31.3	37.44	21.8	37.86	32.3	17.69	11.3	32.68	37.3
26.7	59.89	32.4	37.76	21.3	38.17	33.3	18.07	10.9	33.36	38.2
Nov. 5.7	60.19	34.0	38.07	20.7	38.47	34.8	18.46	10.7	34.00	39.7
15.7	60.48	36.0	38.38	20.0	38.76	36.8	18.83	10.7	34.59	41.9
25.6	60.75	38.4	38.67	19.4	39.03	39.1	19.18	10.9	35.11	44.5
Dec. 5.6	60.98	41.1	38.94	18.9	39.27	41.7	19.50	11.3	35.53	47.6
15.6	61.18	43.9	39.17	18.5	39.48	44.4	19.78	11.8	35.84	51.0
25.5	61.33	46.8	39.37	18.1	39.64	47.2	20.02	12.6	36.04	54.5
35.5	61.43	49.7	39.52	17.9	39.76	50.0	20.21	13.5	36.11	58.2

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	25 Camelop. (H.).		δ Geminorum.		Piazzii vii, 67.		β Canis Minoris.		α² Geminorum. (Castor.)	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 7 11	° ' +82 35	h m 7 14	° ' +22 9	h m 7 21	° ' +68 39	h m 7 22	° ' + 8 28	h m 7 28	° ' +32 5
	s	"	s	"	s	"	s	"	s	"
Jan. 0.5	39.80	26.1	34.60	8.7	14.30	15.8	6.90	32.7	40.46	29.0
10.5	40.32	29.2	34.74	8.6	14.57	18.3	7.03	31.7	40.62	29.5
20.5	40.49	32.3	34.82	8.7	14.71	20.9	7.11	30.9	40.72	30.2
30.5	40.32	35.4	34.85	8.9	14.73	23.6	7.14	30.2	40.77	30.9
Feb. 9.4	39.81	38.4	34.82	9.2	14.61	26.1	7.12	29.7	40.76	31.8
19.4	38.99	41.1	34.75	9.5	14.38	28.5	7.05	29.4	40.69	32.7
Mar. 1.4	37.91	43.4	34.64	9.9	14.05	30.6	6.95	29.3	40.57	33.6
11.3	36.61	45.0	34.49	10.4	13.64	32.3	6.81	29.2	40.42	34.4
21.3	35.15	46.5	34.32	10.8	13.17	33.6	6.65	29.3	40.24	35.1
31.3	33.61	47.2	34.13	11.1	12.66	34.5	6.48	29.5	40.04	35.6
Apr. 10.3	32.05	47.4	33.95	11.4	12.14	34.8	6.31	29.8	39.84	36.1
20.2	30.53	47.0	33.77	11.7	11.63	34.7	6.14	30.1	39.65	36.3
30.2	29.12	46.0	33.62	11.9	11.17	34.1	5.99	30.5	39.47	36.4
May 10.2	27.86	44.5	33.49	12.0	10.76	33.0	5.87	31.0	39.32	36.3
20.2	26.81	42.6	33.40	12.1	10.42	31.6	5.77	31.6	39.20	36.1
30.1	26.00	40.4	33.34	12.1	10.17	29.8	5.71	32.2	39.13	35.8
June 9.1	25.45	37.8	33.32	12.2	10.01	27.7	5.68	32.9	39.09	35.3
19.1	25.18	35.0	33.34	12.2	9.95	25.4	5.69	33.6	39.09	34.8
29.0	25.20	32.1	33.39	12.1	9.99	23.0	5.73	34.3	39.14	34.2
July 9.0	25.50	29.1	33.49	12.1	10.13	20.5	5.81	35.1	39.23	33.6
19.0	26.08	26.2	33.62	12.1	10.37	18.0	5.92	35.8	39.36	32.9
29.0	26.93	23.3	33.79	12.0	10.70	15.6	6.06	36.5	39.52	32.2
Aug. 7.9	28.02	20.6	33.98	11.9	11.11	13.2	6.24	37.1	39.72	31.5
17.9	29.33	18.1	34.20	11.8	11.60	11.0	6.44	37.7	39.95	30.8
27.9	30.85	15.9	34.45	11.6	12.15	9.0	6.66	38.1	40.20	30.1
Sept. 6.9	32.53	14.0	34.71	11.4	12.77	7.2	6.90	38.3	40.48	29.3
16.8	34.36	12.4	35.00	11.0	13.43	5.6	7.16	38.3	40.78	28.6
26.8	36.29	11.2	35.30	10.6	14.14	4.4	7.43	38.1	41.10	27.8
Oct. 6.8	38.30	10.5	35.61	10.0	14.88	3.5	7.72	37.7	41.44	27.0
16.7	40.35	10.2	35.93	9.4	15.64	3.0	8.02	37.1	41.79	26.3
26.7	42.40	10.4	36.25	8.8	16.40	2.8	8.32	36.2	42.14	25.6
Nov. 5.7	44.40	11.1	36.58	8.1	17.16	3.1	8.62	35.2	42.50	25.0
15.7	46.30	12.2	36.90	7.4	17.90	3.7	8.92	34.1	42.85	24.6
25.6	48.07	13.8	37.20	6.8	18.59	4.8	9.21	32.9	43.19	24.2
Dec. 5.6	49.64	15.9	37.48	6.2	19.22	6.3	9.47	31.6	43.50	24.0
15.6	50.97	18.3	37.73	5.8	19.77	8.1	9.71	30.4	43.79	24.0
25.6	52.03	21.0	37.95	5.5	20.23	10.3	9.92	29.3	44.03	24.2
35.5	52.78	24.0	38.12	5.3	20.58	12.7	10.08	28.2	44.23	24.6

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Canis Minoris. (Procyon.)		$\beta$ Geminorum. (Pollux.)		$\phi$ Geminorum.		26 Lynxis.		Groombridge 1374.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m	° ' "	h m	° ' "	h m	° ' "	h m	° ' "	h m	° ' "
	7 34	+ 5 27	7 39	+28 14	7 47	+27 0	7 47	+47 48	7 49	+74 9
	s	"	s	"	s	"	s	"	s	"
Jan. 0.6	26.45	43.4	37.96	58.2	48.80	19.0	57.21	14.6	6.88	53.2
10.5	26.58	42.2	38.13	58.4	48.97	19.1	57.43	16.0	7.30	55.8
20.5	26.67	41.2	38.24	58.8	49.09	19.3	57.58	17.5	7.56	58.6
30.5	26.71	40.3	38.29	59.3	49.15	19.8	57.66	19.2	7.65	61.5
Feb. 9.4	26.70	39.6	38.29	60.0	49.16	20.3	57.66	20.9	7.57	64.3
	26.64	39.1	38.24	60.7	49.12	21.0	57.59	22.6	7.34	67.0
Mar. 1.4	26.54	38.8	38.14	61.4	49.03	21.7	57.46	24.2	6.96	69.5
11.4	26.41	38.6	38.00	62.1	48.89	22.4	57.28	25.6	6.45	71.6
21.3	26.25	38.6	37.83	62.8	48.73	23.1	57.06	26.8	5.85	73.3
31.3	26.08	38.7	37.64	63.4	48.55	23.7	56.81	27.8	5.19	74.5
	25.91	38.9	37.45	63.9	48.37	24.2	56.55	28.4	4.50	75.2
Apr. 10.3	25.74	39.2	37.26	64.2	48.19	24.6	56.30	28.8	3.80	75.3
20.3	25.59	39.7	37.09	64.4	48.02	24.8	56.06	28.8	3.13	75.0
May 10.2	25.46	40.2	36.94	64.5	47.87	25.0	55.85	28.5	2.52	74.1
20.2	25.35	40.8	36.83	64.4	47.75	25.0	55.68	27.9	1.99	72.7
	25.28	41.5	36.75	64.3	47.66	24.9	55.55	27.0	1.56	71.0
June 9.1	25.24	42.2	36.70	64.0	47.61	24.7	55.47	25.9	1.25	69.0
19.1	25.24	43.0	36.69	63.7	47.60	24.5	55.44	24.6	1.06	66.6
29.0	25.27	43.9	36.73	63.3	47.63	24.2	55.46	23.2	0.99	64.0
July 9.0	25.33	44.8	36.80	62.9	47.70	23.8	55.54	21.7	1.05	61.3
	25.43	45.6	36.92	62.5	47.80	23.4	55.66	20.1	1.24	58.5
Aug. 8.0	25.56	46.4	37.06	62.0	47.94	22.9	55.83	18.5	1.56	55.7
17.9	25.72	47.2	37.24	61.4	48.11	22.4	56.05	16.9	2.00	53.0
27.9	25.90	47.8	37.45	60.8	48.31	21.9	56.30	15.3	2.54	50.3
	26.10	48.2	37.68	60.2	48.54	21.3	56.59	13.7	3.18	47.9
	26.33	48.5	37.94	59.5	48.79	20.6	56.92	12.2	3.92	45.6
Sept. 6.9	26.58	48.5	38.22	58.8	49.06	19.8	57.28	10.8	4.74	43.6
16.8	26.85	48.4	38.52	58.0	49.36	19.0	57.66	9.5	5.62	41.9
26.8	27.13	47.9	38.84	57.2	49.67	18.2	58.07	8.4	6.56	40.6
Oct. 6.8	27.42	47.2	39.18	56.4	50.00	17.3	58.49	7.4	7.53	39.6
	27.72	46.3	39.52	55.6	50.34	16.4	58.93	6.6	8.53	39.1
Nov. 5.7	28.02	45.2	39.86	54.8	50.68	15.6	59.37	6.1	9.53	39.0
15.7	28.32	44.0	40.20	54.1	51.02	14.8	59.81	5.9	10.51	39.4
25.7	28.61	42.6	40.54	53.5	51.36	14.1	60.24	5.9	11.45	40.3
Dec. 5.6	28.88	41.1	40.85	53.1	51.67	13.5	60.64	6.2	12.32	41.6
	29.12	39.7	41.13	52.8	51.96	13.1	61.01	6.9	13.10	43.3
15.6	29.33	38.3	41.38	52.7	52.21	12.9	61.33	7.8	13.77	45.4
25.6	29.50	37.0	41.58	52.8	52.42	12.8	61.59	9.0	14.29	47.9

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\omega^1$ Cancr.		3 Ursæ Maj. (H.).		15 Argûs ( $\rho$ .)		$\zeta^1$ Cancr.		$\beta$ Cancr.											
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.										
	h m 7 55	° +25 38	h m 8 3	° +68 44	h m 8 3	° -24 2	h m 8 6	° +17 55	h m 8 11	° + 9 28										
	s	"	s	"	s	"	s	"	s	"										
Jan. 0.6	18.64	.18	45.9	0.0	35.38	.38	45.6	2.3	35.73	.15	8.7	2.8	53.08	.18	38.1	0.6	28.66	.18	17.1	1.1
10.5	18.82	.13	45.9	0.1	35.76	.25	47.9	2.5	35.88	.10	11.5	2.8	53.26	.13	37.5	0.6	28.84	.13	16.0	0.9
20.5	18.95	.07	46.0	0.4	36.01	.12	50.4	2.6	35.98	.04	14.2	2.7	53.39	.08	37.2	0.3	28.97	.08	15.1	0.7
30.5	19.02	.02	46.4	0.5	36.13	.00	53.0	2.7	36.02	.01	16.7	2.5	53.47	.03	37.0	0.0	29.05	.02	14.4	0.5
Feb. 9.5	19.04	.04	46.9	0.6	36.13	.13	55.7	2.6	36.01	.06	19.0	2.1	53.50	.03	37.0	0.2	29.07	.02	13.9	0.3
19.4	19.00	.09	47.5	0.6	36.00	.24	58.3	2.4	35.95	.11	21.1	1.7	53.47	.07	37.2	0.3	29.05	.07	13.6	0.2
Mar. 1.4	18.91	.12	48.1	0.7	35.76	.34	60.7	2.2	35.84	.14	22.8	1.7	53.40	.11	37.5	0.3	28.98	.07	13.4	0.2
11.4	18.79	.15	48.8	0.7	35.42	.42	62.9	1.8	35.70	.17	24.2	1.4	53.29	.14	37.9	0.4	28.88	.10	13.4	0.0
21.3	18.64	.18	49.5	0.6	35.00	.47	64.7	1.3	35.53	.18	25.2	1.0	53.15	.16	38.3	0.5	28.74	.15	13.6	0.2
31.3	18.46	.18	50.1	0.5	34.53	.50	66.0	0.9	35.35	.20	25.8	0.3	52.99	.17	38.8	0.4	28.59	.16	13.8	0.3
Apr. 10.3	18.28	.18	50.6	0.4	34.03	.51	66.9	0.4	35.15	.19	26.1	0.1	52.82	.16	39.2	0.5	28.43	.16	14.1	0.4
20.3	18.10	.17	51.0	0.3	33.52	.49	67.3	0.2	34.96	.19	26.0	0.1	52.66	.16	39.7	0.4	28.27	.16	14.5	0.5
30.2	17.93	.15	51.3	0.3	33.03	.46	67.1	0.6	34.77	.17	25.6	0.4	52.50	.14	40.1	0.4	28.11	.13	15.0	0.5
May 10.2	17.78	.12	51.5	0.1	32.57	.40	66.5	1.0	34.60	.15	24.8	1.1	52.36	.12	40.4	0.3	27.98	.12	15.5	0.5
20.2	17.66	.09	51.6	0.0	32.17	.32	65.5	1.4	34.45	.12	23.7	1.4	52.24	.09	40.7	0.3	27.86	.09	16.0	0.5
30.2	17.57	.05	51.6	0.1	31.85	.25	64.1	1.8	34.33	.09	22.3	1.6	52.15	.06	41.0	0.3	27.77	.06	16.5	0.6
June 9.1	17.52	.01	51.5	0.1	31.60	.15	62.3	2.1	34.24	.06	20.7	1.9	52.09	.02	41.3	0.2	27.71	.03	17.1	0.6
19.1	17.51	.02	51.4	0.3	31.45	.06	60.2	2.3	34.18	.02	18.8	2.1	52.07	.01	41.5	0.2	27.68	.00	17.7	0.6
29.1	17.53	.06	51.1	0.3	31.39	.03	57.9	2.5	34.16	.01	16.7	2.2	52.08	.04	41.7	0.1	27.68	.04	18.3	0.6
July 9.0	17.59	.09	50.8	0.3	31.42	.13	55.4	2.6	34.17	.05	14.5	2.2	52.12	.08	41.8	0.1	27.72	.07	18.9	0.6
19.0	17.68	.13	50.5	0.4	31.55	.22	52.8	2.7	34.22	.08	12.3	2.3	52.20	.11	41.9	0.0	27.79	.09	19.5	0.5
29.0	17.81	.16	50.1	0.5	31.77	.30	50.1	2.6	34.30	.11	10.0	2.2	52.31	.14	41.9	0.1	27.88	.13	20.0	0.4
Aug. 8.0	17.97	.19	49.6	0.5	32.07	.39	47.5	2.6	34.41	.14	7.8	2.0	52.45	.17	41.8	0.1	28.01	.16	20.4	0.3
17.9	18.16	.22	49.1	0.6	32.46	.47	44.9	2.5	34.55	.18	5.8	1.8	52.62	.19	41.7	0.3	28.17	.18	20.7	0.1
27.9	18.38	.24	48.5	0.7	32.93	.54	42.4	2.3	34.73	.21	4.0	1.5	52.81	.22	41.4	0.4	28.35	.21	20.8	0.0
Sept. 6.9	18.62	.26	47.8	0.7	33.47	.60	40.1	2.0	34.94	.23	2.5	1.1	53.03	.24	41.0	0.5	28.56	.23	20.8	0.2
16.9	18.88	.29	47.1	0.8	34.07	.65	38.1	1.9	35.17	.26	1.4	0.7	53.27	.27	40.5	0.7	28.79	.25	20.6	0.4
26.8	19.17	.31	46.3	0.9	34.72	.70	36.2	1.5	35.43	.28	0.7	0.2	53.54	.29	39.8	0.8	29.04	.27	20.2	0.6
Oct. 6.8	19.48	.32	45.4	0.9	35.42	.74	34.7	1.2	35.71	.30	0.5	0.2	53.83	.30	39.0	0.9	29.31	.29	19.6	0.8
16.8	19.80	.34	44.5	1.0	36.16	.76	33.5	0.8	36.01	.31	0.7	0.8	54.13	.32	38.1	1.0	29.60	.30	18.8	1.0
26.7	20.14	.34	43.5	0.9	36.92	.77	32.7	0.4	36.32	.31	1.5	1.2	54.45	.32	37.1	1.1	29.90	.31	17.8	1.2
Nov. 5.7	20.48	.34	42.6	0.9	37.69	.76	32.3	0.0	36.63	.31	2.7	1.7	54.77	.33	36.0	1.2	30.21	.32	16.6	1.3
15.7	20.82	.33	41.7	0.8	38.45	.74	32.3	0.5	36.94	.31	4.4	2.1	55.10	.32	34.8	1.1	30.53	.31	15.3	1.4
25.7	21.15	.32	40.9	0.7	39.19	.70	32.8	1.0	37.25	.28	6.5	2.4	55.42	.31	33.7	1.1	30.84	.30	13.9	1.4
Dec. 5.6	21.47	.29	40.2	0.5	39.89	.64	33.8	1.3	37.53	.26	8.9	2.6	55.73	.28	32.6	1.0	31.14	.27	12.5	1.4
15.6	21.76	.26	39.7	0.4	40.53	.55	35.1	1.8	37.79	.22	11.5	2.8	56.01	.25	31.6	0.8	31.41	.25	11.1	1.3
25.6	22.02	.21	39.3	0.1	41.08	.45	36.9	2.1	38.01	.18	14.3	2.8	56.26	.22	30.8	0.7	31.66	.20	9.8	1.2
35.6	22.23		39.2		41.53		39.0		38.19		17.1		56.48		30.1		31.86		8.6	

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	30 Monocerotis.		θ Chamæleontis.		η Cancr.		σ Hydræ.		γ Cancr.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 8 21	° ' " - 3 36	h m 8 23	° ' " - 77 10	h m 8 27	° ' " + 20 45	h m 8 33	° ' " + 3 39	h m 8 37	° ' " + 21 47
	s	"	s	"	s	"	s	"	s	"
Jan. 0.6	1.26	11.5	33.45	57.6	20.18	21.3	54.15	63.3	54.57	66.3
10.6	1.43	13.4	33.70	61.3	20.39	20.8	54.34	61.8	54.78	65.9
20.5	1.56	15.1	33.76	65.0	20.54	20.5	54.48	60.5	54.95	65.7
30.5	1.64	16.6	33.64	68.7	20.64	20.5	54.58	59.4	55.06	65.7
Feb 9.5	1.67	17.9	33.33	72.3	20.69	20.7	54.62	58.5	55.12	65.9
19.4	1.65	19.0	32.86	75.7	20.69	21.0	54.62	57.8	55.13	66.3
Mar. 1.4	1.58	19.8	32.24	78.8	20.63	21.5	54.57	57.4	55.08	66.8
11.4	1.48	20.4	31.48	81.6	20.54	22.0	54.48	57.1	55.00	67.4
21.4	1.35	20.7	30.62	84.0	20.41	22.6	54.36	57.0	54.88	68.1
31.3	1.20	20.9	29.68	85.9	20.26	23.2	54.22	57.0	54.73	68.7
Apr. 10.3	1.04	20.8	28.68	87.3	20.10	23.8	54.07	57.2	54.57	69.4
20.3	0.88	20.6	27.65	88.2	19.93	24.3	53.91	57.6	54.40	70.0
30.3	0.72	20.2	26.61	88.6	19.77	24.8	53.76	58.0	54.24	70.5
May 10.2	0.58	19.6	25.60	88.4	19.62	25.2	53.62	58.6	54.09	70.9
20.2	0.45	18.8	24.63	87.7	19.49	25.5	53.50	59.2	53.96	71.3
30.2	0.35	17.9	23.72	86.5	19.39	25.7	53.40	59.9	53.85	71.5
June 9.2	0.28	16.9	22.90	84.9	19.32	25.9	53.32	60.7	53.77	71.6
19.1	0.24	15.8	22.19	82.7	19.28	26.0	53.28	61.5	53.72	71.7
29.1	0.23	14.6	21.60	80.2	19.27	26.0	53.26	62.3	53.71	71.7
July 9.1	0.25	13.4	21.15	77.4	19.30	26.0	53.27	63.1	53.72	71.6
19.0	0.30	12.1	20.85	74.4	19.36	25.8	53.32	63.9	53.77	71.4
29.0	0.38	10.9	20.71	71.2	19.45	25.6	53.39	64.7	53.86	71.1
Aug 8.0	0.48	9.8	20.73	67.9	19.57	25.3	53.49	65.4	53.97	70.7
18.0	0.62	8.8	20.92	64.7	19.72	24.9	53.62	66.0	54.11	70.2
27.9	0.79	7.9	21.27	61.6	19.90	24.4	53.78	66.4	54.28	69.6
Sept. 6.9	0.98	7.3	21.79	58.9	20.10	23.8	53.96	66.6	54.48	68.8
16.9	1.19	7.0	22.45	56.5	20.34	23.1	54.17	66.6	54.70	68.0
26.8	1.43	7.0	23.23	54.6	20.60	22.2	54.40	66.3	54.95	67.0
Oct. 6.8	1.69	7.2	24.12	53.2	20.88	21.2	54.66	65.8	55.23	66.0
16.8	1.97	7.8	25.08	52.4	21.18	20.1	54.94	65.0	55.53	64.8
26.8	2.27	8.8	26.09	52.3	21.49	18.9	55.23	64.0	55.85	63.5
Nov. 5.7	2.57	10.0	27.10	52.8	21.82	17.7	55.54	62.7	56.18	62.2
15.7	2.88	11.5	28.08	54.0	22.16	16.5	55.85	61.3	56.51	60.9
25.7	3.18	13.2	29.00	55.8	22.49	15.3	56.17	59.7	56.85	59.7
Dec. 5.7	3.47	15.1	29.82	58.2	22.81	14.2	56.47	58.0	57.18	58.6
15.6	3.74	17.0	30.51	61.1	23.12	13.2	56.75	56.3	57.50	57.6
25.6	3.99	19.0	31.05	64.3	23.39	12.4	57.02	54.6	57.78	56.8
35.6	4.19	20.9	31.41	67.8	23.63	11.8	57.23	53.0	58.02	56.2



# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Hydræ.		σ <sup>2</sup> Cancrī (mean).		ι Ursæ Majoris.		σ <sup>2</sup> Ursæ Majoris.		κ Cancrī.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 8 41	° + 6 45	h m 8 48	° +30 55	h m 8 52	° +48 24	h m 9 2	° +67 30	h m 9 2	° +11 2
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 0.6	51.38	34.4	34.55	48.1	50.95	16.4	14.09	33.9	42.84	30.6
10.6	51.58	33.1	34.79	48.1	51.25	17.4	14.58	35.7	43.06	29.4
20.5	51.74	32.0	34.98	48.4	51.49	18.7	14.96	37.9	43.24	28.4
30.5	51.84	31.0	35.12	49.0	51.66	20.2	15.23	40.3	43.37	27.7
Feb. 9.5	51.90	30.3	35.20	49.7	51.75	21.9	15.38	42.9	43.45	27.2
19.5	51.90	29.8	35.22	50.6	51.77	23.8	15.40	45.6	43.48	26.9
Mar. 1.4	51.86	29.5	35.18	51.6	51.72	25.7	15.30	48.3	43.46	26.8
11.4	51.78	29.3	35.09	52.7	51.61	27.5	15.10	50.8	43.39	26.9
21.4	51.67	29.4	34.97	53.8	51.45	29.2	14.81	53.0	43.30	27.1
31.3	51.53	29.5	34.82	54.8	51.24	30.8	14.44	55.0	43.17	27.5
Apr. 10.3	51.38	29.8	34.65	55.7	51.01	32.0	14.02	56.6	43.03	27.9
20.3	51.22	30.2	34.47	56.4	50.77	32.9	13.57	57.7	42.88	28.4
30.3	51.07	30.7	34.29	57.0	50.52	33.5	13.11	58.3	42.73	28.9
May 10.2	50.93	31.2	34.12	57.4	50.29	33.8	12.66	58.4	42.59	29.4
20.2	50.81	31.8	33.97	57.7	50.08	33.7	12.24	58.0	42.46	30.0
30.2	50.70	32.4	33.85	57.7	49.90	33.3	11.86	57.2	42.35	30.5
June 9.2	50.63	33.0	33.76	57.5	49.75	32.6	11.54	56.0	42.26	31.1
19.1	50.58	33.7	33.70	57.2	49.65	31.6	11.28	54.3	42.20	31.6
29.1	50.56	34.4	33.67	56.8	49.59	30.3	11.00	52.3	42.17	32.0
July 9.1	50.56	35.1	33.67	56.2	49.58	28.8	11.00	50.0	42.16	32.4
19.0	50.60	35.7	33.72	55.5	49.61	27.1	10.98	47.5	42.19	32.8
29.0	50.67	36.3	33.79	54.6	49.69	25.3	11.04	44.8	42.24	33.1
Aug. 8.0	50.77	36.8	33.90	53.7	49.81	23.4	11.19	42.0	42.32	33.3
18.0	50.89	37.1	34.04	52.6	49.97	21.4	11.42	39.1	42.42	33.4
27.9	51.04	37.3	34.21	51.5	50.18	19.3	11.72	36.2	42.56	33.3
Sept. 6.9	51.22	37.4	34.42	50.2	50.43	17.3	12.10	33.4	42.72	33.0
16.9	51.43	37.2	34.65	48.9	50.72	15.2	12.55	30.7	42.91	32.6
26.9	51.66	36.8	34.91	47.5	51.04	13.2	13.07	28.2	43.13	32.0
Oct. 6.8	51.91	36.2	35.20	46.1	51.40	11.3	13.65	25.9	43.38	31.1
16.8	52.19	35.3	35.52	44.7	51.80	9.6	14.28	23.9	43.65	30.0
26.8	52.48	34.2	35.86	43.3	52.22	8.0	14.96	22.2	43.94	28.8
Nov. 5.7	52.79	32.9	36.21	41.9	52.66	6.7	15.67	20.9	44.25	27.4
15.7	53.10	31.5	36.58	40.7	53.11	5.6	16.40	20.0	44.57	25.9
25.7	53.42	29.9	36.94	39.6	53.56	4.8	17.13	19.6	44.90	24.3
Dec. 5.7	53.73	28.2	37.30	38.6	54.01	4.4	17.85	19.6	45.22	22.7
15.6	54.02	26.6	37.64	37.9	54.43	4.4	18.53	20.2	45.53	21.2
25.6	54.28	25.1	37.95	37.5	54.82	4.8	19.16	21.3	45.81	19.7
35.6	54.51	23.6	38.23	37.3	55.16	5.5	19.71	22.8	46.06	18.4

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\theta$ Hydræ.		$\beta$ Argûs.		$\iota$ Argûs.		$\alpha$ Lyncis.		$\alpha$ Hydræ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 9 9	° ' " + 2 42	h m 9 12	° ' " - 69 19	h m 9 14	° ' " - 58 52	h m 9 15	° ' " + 34 46	h m 9 23	° ' " - 8 15
Jan. 0.6	31.80	23.7	14.48	50.7	37.99	54.1	23.60	62.3	1.30	17.0
10.6	32.02	22.0	14.82	54.2	38.26	57.7	23.88	62.4	1.53	19.2
20.6	32.20	22.0	15.04	58.0	38.45	61.4	24.11	62.8	1.71	21.3
30.5	32.33	19.3	15.14	61.8	38.56	65.1	24.28	63.5	1.85	23.2
Feb. 9.5	32.41	18.2	15.13	65.6	38.59	68.8	24.39	64.4	1.93	24.9
19.5	32.44	17.4	15.00	69.3	38.53	72.3	24.44	65.5	1.97	26.4
Mar. 1.5	32.42	16.8	14.77	72.7	38.40	75.7	24.43	66.8	1.96	27.7
11.4	32.37	16.4	14.44	75.9	38.20	78.7	24.37	68.1	1.91	28.7
21.4	32.28	16.3	14.03	78.8	37.95	81.3	24.26	69.4	1.82	29.4
31.4	32.16	16.3	13.55	81.2	37.65	83.6	24.12	70.7	1.71	29.9
Apr. 10.3	32.02	16.4	13.02	83.2	37.31	85.4	23.95	71.8	1.58	30.1
20.3	31.88	16.7	12.45	84.7	36.95	86.7	23.77	72.8	1.43	30.1
30.3	31.73	17.2	11.87	85.7	36.57	87.5	23.59	73.6	1.28	29.9
May 10.3	31.59	17.7	11.28	86.1	36.20	87.8	23.41	74.2	1.14	29.5
20.2	31.46	18.3	10.70	86.0	35.84	87.6	23.25	74.5	1.00	28.9
30.2	31.35	18.9	10.14	85.4	35.49	86.9	23.11	74.6	0.88	28.1
June 9.2	31.26	19.7	9.62	84.2	35.17	85.6	22.99	74.5	0.78	27.2
19.2	31.19	20.5	9.15	82.6	34.88	84.0	22.90	74.1	0.70	26.1
29.1	31.15	21.3	8.74	80.6	34.64	81.9	22.85	73.5	0.65	25.0
July 9.1	31.14	22.0	8.40	78.1	34.45	79.4	22.83	72.8	0.61	23.8
19.1	31.15	22.8	8.15	75.3	34.30	76.7	22.84	71.8	0.61	22.5
29.0	31.19	23.6	7.98	72.3	34.22	73.8	22.88	70.7	0.63	21.2
Aug. 8.0	31.26	24.2	7.90	69.2	34.20	70.7	22.96	69.5	0.67	20.0
18.0	31.35	24.7	7.93	66.0	34.24	67.6	23.08	68.2	0.75	18.8
28.0	31.48	25.1	8.06	62.8	34.35	64.6	23.23	66.7	0.85	17.8
Sept. 6.9	31.63	25.3	8.30	59.9	34.53	61.8	23.41	65.1	0.99	17.1
16.9	31.81	25.2	8.63	57.2	34.78	59.3	23.62	63.5	1.15	16.6
26.9	32.02	24.9	9.06	54.9	35.09	57.2	23.87	61.8	1.35	16.4
Oct. 6.9	32.25	24.4	9.57	53.1	35.45	55.6	24.15	60.1	1.57	16.5
16.8	32.51	23.5	10.15	51.9	35.87	54.6	24.46	58.3	1.82	17.0
26.8	32.80	22.4	10.78	51.3	36.33	54.2	24.80	56.6	2.10	17.8
Nov. 5.8	33.10	21.1	11.45	51.3	36.81	54.4	25.16	55.0	2.40	19.0
15.7	33.41	19.5	12.12	52.0	37.30	55.3	25.53	53.6	2.71	20.5
25.7	33.73	17.8	12.79	53.3	37.79	56.8	25.91	52.3	3.03	22.2
Dec. 5.7	34.05	16.0	13.42	55.3	38.26	58.9	26.29	51.2	3.34	24.2
15.7	34.35	14.2	13.99	57.9	38.69	61.5	26.66	50.5	3.65	26.4
25.6	34.63	12.4	14.49	60.9	39.07	64.5	27.00	50.0	3.93	28.6
35.6	34.88	10.6	14.89	64.2	39.39	67.9	27.31	49.8	4.18	30.8

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Draconis (H.).		δ Ursæ Majoris.		θ Ursæ Majoris.		ιo Leonis Minoris.		ο Leonis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 9 23	° ' " +81 43	h m 9 26	° ' " +70 13	h m 9 26	° ' " +52 5	h m 9 28	° ' " +36 48	h m 9 36	° ' " +10 18
Jan. 0.6	56.03	65.1	17.16	70.0	38.68	55.1	31.77	30.7	11.33	54.3
10.6	57.26	67.2	17.75	71.7	39.04	56.0	32.07	30.8	11.58	52.9
20.6	58.26	69.7	18.23	73.8	39.34	57.2	32.31	31.2	11.79	51.8
30.5	58.98	72.5	18.58	76.2	39.56	58.8	32.50	31.9	11.95	50.9
Feb. 9.5	59.40	75.5	18.81	78.9	39.71	60.6	32.63	32.9	12.06	50.3
19.5	59.51	78.6	18.89	81.7	39.78	62.6	32.70	34.2	12.12	49.9
Mar. 1.5	59.31	81.7	18.85	84.5	39.77	64.8	32.71	35.6	12.14	49.7
11.4	58.82	84.6	18.68	87.2	39.70	66.9	32.66	37.0	12.11	49.8
21.4	58.08	87.3	18.39	89.7	39.56	68.9	32.56	38.5	12.04	50.0
31.4	57.12	89.6	18.01	91.9	39.37	70.7	32.43	39.9	11.94	50.3
Apr. 10.4	55.98	91.4	17.57	93.8	39.14	72.3	32.27	41.1	11.81	50.8
20.3	54.73	92.7	17.07	95.1	38.89	73.6	32.09	42.2	11.68	51.3
30.3	53.42	93.5	16.55	96.0	38.63	74.5	31.91	43.1	11.54	51.8
May 10.3	52.09	93.7	16.03	96.4	38.37	75.1	31.73	43.8	11.40	52.4
20.2	50.80	93.3	15.53	96.3	38.13	75.2	31.56	44.2	11.27	53.0
30.2	49.59	92.4	15.06	95.7	37.91	75.0	31.40	44.3	11.15	53.6
June 9.2	48.50	90.9	14.65	94.6	37.72	74.4	31.28	44.2	11.05	54.2
19.2	47.57	89.0	14.31	93.0	37.56	73.5	31.18	43.8	10.97	54.7
29.1	46.82	86.7	14.04	91.1	37.45	72.2	31.11	43.2	10.92	55.2
July 9.1	46.27	84.1	13.85	88.8	37.38	70.7	31.07	42.4	10.89	55.6
19.1	45.94	81.1	13.76	86.3	37.36	68.9	31.07	41.4	10.88	56.0
29.1	45.83	78.0	13.75	83.5	37.38	66.9	31.10	40.2	10.90	56.3
Aug. 8.0	45.95	74.7	13.83	80.6	37.45	64.7	31.16	38.8	10.95	56.4
18.0	46.29	71.3	14.01	77.6	37.57	62.4	31.26	37.3	11.02	56.4
28.0	46.85	68.0	14.28	74.5	37.74	60.0	31.40	35.7	11.12	56.3
Sept. 6.9	47.63	64.7	14.63	71.5	37.95	57.6	31.57	34.0	11.25	56.0
16.9	48.61	61.6	15.07	68.5	38.21	55.1	31.78	32.2	11.41	55.5
26.9	49.79	58.6	15.59	65.7	38.51	52.7	32.02	30.3	11.61	54.8
Oct. 6.9	51.13	55.9	16.19	63.1	38.86	50.4	32.29	28.4	11.83	53.9
16.8	52.63	53.6	16.85	60.7	39.25	48.2	32.60	26.5	12.08	52.7
26.8	54.26	51.7	17.57	58.7	39.67	46.2	32.94	24.6	12.35	51.4
Nov. 5.8	55.98	50.2	18.34	57.1	40.12	44.5	33.30	22.9	12.65	49.9
15.8	57.76	49.2	19.15	55.8	40.59	43.0	33.68	21.3	12.97	48.2
25.7	59.56	48.8	19.96	55.1	41.08	41.9	34.07	19.9	13.30	46.5
Dec. 5.7	61.33	48.9	20.77	54.9	41.56	41.2	34.46	18.8	13.62	44.7
15.7	63.03	49.6	21.55	55.2	42.03	40.9	34.84	18.0	13.94	43.0
25.6	64.60	50.9	22.28	56.1	42.47	41.0	35.20	17.5	14.24	41.4
35.6	65.99	52.7	22.94	57.5	42.87	41.6	35.53	17.3	14.52	39.9

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Chamæleontis.		ε Leonis.		μ Leonis.		19 Leonis Minoris.		π Leonis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 9 36	° ' " -80 31	h m 9 40	° ' " +24 11	h m 9 47	° ' " +26 26	h m 9 51	° ' " +41 29	h m 9 55	° ' " + 8 29
Jan. 0.6	46.87	9.3	34.41	64.0	28.47	36.7	59.41	46.6	17.94	24.8
10.6	47.59	12.6	34.69	63.3	28.75	36.1	59.74	46.7	18.20	23.3
20.6	48.09	16.1	34.92	63.0	29.00	35.8	60.02	47.2	18.42	22.0
30.6	48.36	19.9	35.10	62.9	29.19	35.9	60.25	48.1	18.60	20.9
Feb. 9.5	48.39	23.7	35.22	63.1	29.32	36.2	60.41	49.3	18.73	20.1
19.5	48.18	27.5	35.30	63.6	29.40	36.8	60.51	50.7	18.81	19.6
Mar. 1.5	47.75	31.2	35.32	64.2	29.43	37.6	60.55	52.4	18.84	19.3
11.4	47.12	34.7	35.29	65.1	29.41	38.5	60.52	54.1	18.83	19.2
21.4	46.31	37.9	35.22	66.0	29.35	39.6	60.44	55.8	18.78	19.3
31.4	45.34	40.7	35.12	67.0	29.25	40.7	60.32	57.5	18.69	19.6
Apr. 10.4	44.24	43.2	34.99	67.9	29.12	41.7	60.17	59.1	18.59	20.0
20.3	43.04	45.2	34.84	68.8	28.98	42.7	59.99	60.4	18.46	20.5
30.3	41.76	46.7	34.69	69.6	28.82	43.6	59.80	61.5	18.33	21.1
May 10.3	40.44	47.7	34.54	70.3	28.67	44.4	59.60	62.4	18.20	21.7
20.3	39.11	48.2	34.40	70.9	28.52	45.0	59.41	62.9	18.07	22.3
30.2	37.80	48.1	34.27	71.3	28.39	45.4	59.24	63.2	17.95	22.9
June 9.2	36.54	47.5	34.16	71.6	28.27	45.6	59.09	63.1	17.84	23.5
19.2	35.36	46.4	34.07	71.7	28.18	45.7	58.96	62.7	17.76	24.1
29.1	34.28	44.8	34.01	71.6	28.11	45.6	58.86	62.0	17.69	24.6
July 9.1	33.34	42.7	33.97	71.4	28.06	45.3	58.79	61.0	17.65	25.1
19.1	32.56	40.3	33.96	71.0	28.04	44.8	58.76	59.8	17.63	25.5
29.1	31.97	37.5	33.98	70.6	28.06	44.2	58.76	58.4	17.63	25.9
Aug. 8.0	31.58	34.5	34.03	69.9	28.10	43.4	58.80	56.8	17.66	26.1
18.0	31.41	31.3	34.10	69.1	28.17	42.4	58.87	55.0	17.71	26.2
28.0	31.48	28.1	34.21	68.2	28.27	41.3	58.98	53.1	17.79	26.1
Sept. 7.0	31.77	25.0	34.35	67.1	28.40	40.1	59.13	51.0	17.90	25.9
16.9	32.29	22.1	34.52	65.8	28.57	38.7	59.32	48.8	18.04	25.5
26.9	33.03	19.5	34.72	64.4	28.77	37.2	59.54	46.6	18.22	24.8
Oct. 6.9	33.97	17.3	34.96	62.9	29.00	35.5	59.81	44.4	18.42	23.9
16.8	35.07	15.6	35.22	61.3	29.26	33.8	60.11	42.2	18.66	22.8
26.8	36.30	14.5	35.52	59.6	29.56	32.0	60.45	40.1	18.93	21.4
Nov. 5.8	37.62	14.0	35.84	57.8	29.88	30.2	60.82	38.1	19.22	19.9
15.8	38.98	14.2	36.17	56.1	30.22	28.4	61.21	36.3	19.53	18.2
25.7	40.33	15.0	36.52	54.5	30.57	26.7	61.62	34.7	19.85	16.4
Dec. 5.7	41.62	16.5	36.88	53.0	30.93	25.2	62.04	33.4	20.18	14.5
15.7	42.80	18.6	37.22	51.6	31.28	23.8	62.45	32.5	20.50	12.7
25.7	43.83	21.2	37.55	50.5	31.62	22.8	62.84	32.0	20.81	10.9
35.6	44.68	24.3	37.85	49.6	31.93	22.0	63.20	31.8	21.10	9.3

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Leonis. (Regulus.)		32 Ursæ Majoris.		$\lambda$ Ursæ Majoris.		$\gamma^1$ Leonis.		$\mu$ Hydræ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 10 3	° ' +12 25	h m 10 11	° ' +65 33	h m 10 11	° ' +43 22	h m 10 14	° ' +20 18	h m 10 21	° ' -16 21
	s	"	s	"	s	"	s	"	s	"
Jan. 0.7	25.12	16.6	17.44	68.3	29.34	35.0	50.61	39.5	35.60	34.3
	.27	1.4	.36	1.0	.35	.00	.29	1.0	.27	2.5
10.6	25.39	15.2	18.00	69.3	29.69	35.0	50.90	38.5	35.87	36.8
	.23	1.1	.49	1.5	.31	.05	.25	.8	.23	2.5
20.6	25.62	14.1	18.49	70.8	30.00	35.5	51.15	37.7	36.10	39.3
	.19	.9	.39	1.9	.26	.09	.21	.4	.19	2.4
30.6	25.81	13.2	18.88	72.7	30.26	36.4	51.36	37.3	36.29	41.7
	.14	.6	.30	2.3	.19	1.2	.16	.2	.15	2.3
Feb. 9.5	25.95	12.6	19.18	75.0	30.45	37.6	51.52	37.1	36.44	44.0
	.09	.3	.18	2.5	.13	1.5	.11	.2	.09	2.0
19.5	26.04	12.3	19.36	77.5	30.58	39.1	51.63	37.3	36.53	46.0
	.04	.1	.07	2.7	.06	1.7	.05	.4	.05	1.9
Mar. 1.5	26.08	12.2	19.43	80.2	30.64	40.8	51.68	37.3	36.58	47.9
	.00	.2	.03	2.8	.00	1.8	.01	.6	.00	1.6
11.5	26.08	12.4	19.40	83.0	30.64	42.6	51.69	38.3	36.58	49.5
	.05	.3	.13	2.6	.06	1.9	.03	.7	.04	1.3
21.4	26.03	12.7	19.27	85.6	30.58	44.5	51.66	39.0	36.54	50.8
	.08	.5	.22	2.5	.11	1.9	.07	.9	.07	1.0
31.4	25.95	13.2	19.05	88.1	30.47	46.4	51.59	39.9	36.47	51.8
	.10	.6	.29	2.2	.14	1.7	.10	.9	.09	.8
Apr. 10.4	25.85	13.8	18.76	90.3	30.33	48.1	51.49	40.8	36.38	52.6
	.12	.6	.34	1.8	.17	1.6	.12	.9	.12	.5
20.4	25.73	14.4	18.42	92.1	30.16	49.7	51.37	41.7	36.26	53.1
	.13	.7	.38	1.4	.19	1.3	.13	.9	.13	.2
30.3	25.60	15.1	18.04	93.5	29.97	51.0	51.24	42.6	36.13	53.3
	.14	.7	.40	1.0	.20	1.0	.14	.9	.14	.1
May 10.3	25.46	15.8	17.64	94.5	29.77	52.0	51.10	43.5	35.99	53.2
	.13	.6	.40	.5	.19	.6	.13	.8	.13	.3
20.3	25.33	16.4	17.24	95.0	29.58	52.6	50.97	44.2	35.86	52.9
	.12	.6	.39	.0	.19	.4	.13	.6	.13	.5
30.2	25.21	17.0	16.85	95.0	29.39	53.0	50.84	44.8	35.73	52.4
	.10	.6	.36	.5	.17	.0	.11	.4	.12	.7
June 9.2	25.11	17.6	16.49	94.5	29.22	53.0	50.73	45.2	35.61	51.7
	.09	.5	.33	1.0	.14	.3	.10	.3	.11	.9
19.2	25.02	18.1	16.16	93.5	29.08	52.7	50.63	45.5	35.50	50.8
	.07	.4	.27	1.4	.12	.6	.08	.2	.10	1.1
29.2	24.95	18.5	15.89	92.1	28.96	52.1	50.55	45.7	35.40	49.7
	.05	.3	.22	1.8	.09	1.0	.06	.8	.08	1.3
July 9.1	24.90	18.8	15.67	90.3	28.87	51.1	50.49	45.7	35.32	48.4
	.03	.3	.16	2.1	.06	1.2	.04	.1	.06	1.4
19.1	24.87	19.1	15.51	88.2	28.81	49.9	50.45	45.6	35.26	47.0
	.01	.1	.10	2.5	.03	1.5	.01	.3	.04	1.4
29.1	24.86	19.2	15.41	85.7	28.78	48.4	50.44	45.3	35.22	45.6
	.02	.0	.02	2.7	.01	1.7	.01	.5	.01	1.4
Aug. 8.1	24.88	19.2	15.39	83.0	28.79	46.7	50.45	44.8	35.21	44.2
	.05	.2	.04	2.9	.05	1.9	.04	.6	.01	1.4
18.0	24.93	19.0	15.43	80.1	28.84	44.8	50.49	44.2	35.22	42.8
	.08	.3	.12	3.0	.08	2.1	.07	.8	.05	1.3
28.0	25.01	18.7	15.55	77.1	28.92	42.7	50.56	43.4	35.27	41.5
	.10	.5	.19	3.2	.13	2.2	.10	1.0	.07	1.2
Sept. 7.0	25.11	18.2	15.74	73.9	29.05	40.5	50.66	42.4	35.34	40.3
	.14	.7	.26	3.1	.17	2.3	.13	1.1	.11	.9
16.9	25.25	17.5	16.00	70.8	29.22	38.2	50.79	41.3	35.45	39.4
	.17	.9	.33	3.1	.20	2.4	.17	1.4	.15	.7
26.9	25.42	16.6	16.33	67.7	29.42	35.8	50.96	39.9	35.60	38.7
	.20	1.1	.40	3.0	.25	2.4	.20	1.5	.18	.3
Oct. 6.9	25.62	15.5	16.73	64.7	29.67	33.4	51.16	38.4	35.78	38.4
	.23	1.3	.47	2.8	.29	2.4	.23	1.8	.22	.0
16.9	25.85	14.2	17.20	61.9	29.96	31.0	51.39	36.8	36.00	38.4
	.26	1.5	.54	2.6	.33	2.4	.27	1.8	.25	.5
26.8	26.11	12.7	17.74	59.3	30.29	28.6	51.66	35.0	36.25	38.9
	.29	1.6	.59	2.3	.37	2.2	.29	1.9	.28	.8
Nov. 5.8	26.40	11.1	18.33	57.0	30.66	26.4	51.95	33.1	36.53	39.7
	.31	1.8	.63	1.9	.39	2.0	.32	1.9	.30	1.3
15.8	26.71	9.3	18.96	55.1	31.05	24.4	52.27	31.2	36.83	41.0
	.33	1.8	.66	1.5	.42	1.8	.34	1.9	.32	1.6
25.8	27.04	7.5	19.62	53.6	31.47	22.6	52.61	29.3	37.15	42.6
	.34	1.8	.68	1.0	.42	1.4	.34	1.8	.33	1.9
Dec. 5.7	27.38	5.7	20.30	52.6	31.89	21.2	52.95	27.5	37.48	44.5
	.33	1.8	.68	.4	.43	1.1	.35	1.7	.33	2.2
15.7	27.71	3.9	20.98	52.2	32.32	20.1	53.30	25.8	37.81	46.7
	.31	1.7	.65	.1	.41	.7	.34	1.5	.32	2.3
25.7	28.02	2.2	21.63	52.3	32.73	19.4	53.64	24.3	38.13	49.0
	.30	1.5	.60	.6	.38	.2	.31	1.3	.29	2.5
35.6	28.32	0.7	22.23	52.9	33.11	19.2	53.95	23.0	38.42	51.5

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Leonis Minoris.		$\alpha$ Antliae.		$\gamma$ Draconis (H.).		$\rho$ Leonis.		$\delta$ Leonis Minoris.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 10 22	° ' " +37 10	h m 10 22	° ' " -30 35	h m 10 27	° ' " +76 11	h m 10 27	° ' " +9 46	h m 10 38	° ' " +23 40
Jan. 0.7	30.28	53.6	53.99	29.2	13.00	18.4	54.72	66.2	21.35	26.7
10.6	30.62	53.3	54.28	29.1	13.94	19.6	55.01	64.6	21.66	25.6
20.6	30.91	53.3	54.52	29.0	14.76	21.3	55.26	63.3	21.94	24.9
30.6	31.16	53.8	54.71	28.0	15.44	23.5	55.47	62.2	22.17	24.5
Feb. 9.6	31.35	54.6	54.86	40.9	15.96	26.0	55.63	61.4	22.36	24.5
19.5	31.49	55.7	54.95	43.7	16.30	28.9	55.74	60.9	22.49	24.8
Mar. 1.5	31.56	57.1	54.99	46.3	16.45	31.9	55.81	60.6	22.58	25.4
11.5	31.57	58.7	54.98	48.6	16.42	34.9	55.83	60.6	22.61	26.2
21.4	31.53	60.3	54.93	50.6	16.21	37.8	55.81	60.8	22.60	27.2
31.4	31.45	62.0	54.84	52.4	15.85	40.6	55.75	61.1	22.55	28.2
Apr. 10.4	31.33	63.6	54.73	53.8	15.35	43.0	55.67	61.6	22.46	29.4
20.4	31.19	65.0	54.59	54.9	14.75	45.0	55.56	62.2	22.35	30.5
30.3	31.03	66.3	54.44	55.6	14.07	46.6	55.44	62.8	22.23	31.6
May 10.3	30.86	67.4	54.28	56.0	13.34	47.7	55.32	63.5	22.10	32.6
20.3	30.69	68.2	54.11	56.0	12.59	48.2	55.20	64.2	21.96	33.4
30.3	30.53	68.7	53.95	55.7	11.84	48.2	55.08	64.8	21.83	34.1
June 9.2	30.38	68.9	53.80	55.0	11.13	47.7	54.97	65.4	21.71	34.6
19.2	30.25	68.8	53.66	54.0	10.47	46.6	54.87	66.0	21.60	35.0
29.2	30.14	68.5	53.54	52.7	9.89	45.0	54.79	66.5	21.50	35.1
July 9.1	30.05	67.9	53.43	51.1	9.39	43.0	54.72	67.0	21.42	35.0
19.1	29.99	67.0	53.34	49.4	9.00	40.6	54.68	67.3	21.36	34.8
29.1	29.96	65.8	53.28	47.5	8.72	37.8	54.65	67.6	21.33	34.4
Aug. 8.1	29.96	64.4	53.25	45.4	8.55	34.8	54.65	67.7	21.32	33.7
18.0	29.99	62.9	53.25	43.4	8.51	31.6	54.68	67.6	21.34	32.9
28.0	30.06	61.1	53.28	41.4	8.60	28.2	54.73	67.4	21.38	31.9
Sept. 7.0	30.16	59.2	53.35	39.5	8.81	24.7	54.81	67.1	21.45	30.7
17.0	30.30	57.1	53.46	37.9	9.16	21.2	54.92	66.5	21.56	29.3
26.9	30.48	54.9	53.61	36.5	9.64	17.8	55.06	65.7	21.71	27.7
Oct. 6.9	30.70	52.6	53.80	35.5	10.24	14.5	55.24	64.7	21.89	25.9
16.9	30.96	50.3	54.03	34.9	10.96	11.4	55.45	63.4	22.10	24.0
26.8	31.26	48.0	54.30	34.7	11.79	8.6	55.69	61.9	22.35	22.0
Nov. 5.8	31.59	45.7	54.60	35.1	12.71	6.2	55.97	60.3	22.64	20.0
15.8	31.95	43.6	54.93	36.0	13.72	4.2	56.27	58.5	22.95	17.9
25.8	32.33	41.7	55.28	37.3	14.78	2.7	56.59	56.6	23.29	15.8
Dec. 5.7	32.72	40.1	55.63	39.1	15.87	1.7	56.92	54.6	23.64	13.9
15.7	33.12	38.7	55.98	41.3	16.97	1.3	57.26	52.7	24.00	12.1
25.7	33.50	37.7	56.31	43.8	18.04	1.5	57.58	50.8	24.35	10.6
35.7	33.86	37.1	56.62	46.5	19.04	2.3	57.88	49.1	24.68	9.3

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Argus.		ζ Leonis.		δ <sup>2</sup> Chamæleontis.		46 Leonis Minoris.		Groombridge 1706.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 10 41	° ' " -59 11	h m 10 44	° ' " +11 1	h m 10 44	° ' " -80 2	h m 10 48	° ' " +34 42	h m 10 52	° ' " +78 15
Jan. 0.7	28.25	25.6	21.91	73.4	60.56	37.7	6.39	51.4	32.08	52.3
10.6	28.66	28.5	22.21	71.8	61.58	40.4	6.74	50.7	33.22	53.2
20.6	29.01	31.8	22.47	70.5	62.42	43.6	7.05	50.5	34.24	54.7
30.6	29.29	35.4	22.69	69.4	63.08	47.1	7.31	50.6	35.11	56.7
Feb. 9.6	29.50	39.0	22.87	68.6	63.53	50.8	7.53	51.2	35.80	59.1
19.5	29.62	42.7	23.00	68.1	63.76	54.6	7.69	52.1	36.30	61.9
Mar. 1.5	29.67	46.4	23.08	67.9	63.79	58.5	7.79	53.3	36.58	64.9
11.5	29.65	49.9	23.12	67.9	63.61	62.3	7.83	54.7	36.65	68.0
21.5	29.55	53.1	23.11	68.2	63.24	66.0	7.83	56.2	36.52	71.0
31.4	29.40	56.1	23.07	68.6	62.70	69.5	7.78	57.9	36.19	73.9
Apr. 10.4	29.19	58.8	23.00	69.2	61.99	72.7	7.69	59.5	35.69	76.6
20.4	28.94	61.0	22.91	69.8	61.14	75.5	7.57	61.0	35.05	78.9
30.3	28.66	62.9	22.80	70.5	60.18	77.9	7.43	62.4	34.29	80.7
May 10.3	28.35	64.2	22.69	71.3	59.12	79.8	7.28	63.6	33.45	82.1
20.3	28.03	65.1	22.57	72.0	57.99	81.3	7.13	64.6	32.57	82.9
30.3	27.69	65.5	22.45	72.7	56.82	82.2	6.97	65.3	31.68	83.1
June 9.2	27.36	65.4	22.34	73.3	55.63	82.6	6.82	65.7	30.80	82.8
19.2	27.04	64.8	22.23	73.9	54.46	82.4	6.69	65.9	29.97	82.0
29.2	26.73	63.7	22.14	74.4	53.33	81.7	6.57	65.8	29.20	80.7
July 9.2	26.45	62.2	22.07	74.8	52.26	80.4	6.47	65.4	28.52	78.8
19.1	26.20	60.3	22.02	75.1	51.30	78.7	6.39	64.7	27.94	76.6
29.1	25.99	58.0	21.98	75.2	50.47	76.5	6.34	63.7	27.49	73.9
Aug. 8.1	25.83	55.4	21.96	75.3	49.80	73.9	6.32	62.5	27.16	70.9
18.0	25.73	52.6	21.97	75.2	49.31	71.0	6.32	61.1	26.98	67.7
28.0	25.69	49.8	22.00	74.9	49.02	68.0	6.35	59.4	26.94	64.3
Sept. 7.0	25.72	46.9	22.07	74.4	48.94	64.9	6.42	57.5	27.05	60.7
17.0	25.82	44.1	22.16	73.7	49.10	61.8	6.53	55.5	27.31	57.1
26.9	25.99	41.6	22.29	72.8	49.48	58.8	6.67	53.3	27.73	53.5
Oct. 6.9	26.23	39.3	22.45	71.7	50.08	56.1	6.86	51.0	28.30	50.0
16.9	26.55	37.5	22.65	70.3	50.88	53.8	7.08	48.6	29.02	46.7
26.9	26.93	36.2	22.89	68.8	51.87	51.9	7.35	46.2	29.88	43.6
Nov. 5.8	27.37	35.5	23.16	67.0	53.00	50.5	7.65	43.8	30.86	40.9
15.8	27.85	35.3	23.45	65.1	54.25	49.8	7.99	41.5	31.96	38.6
25.8	28.36	35.8	23.77	63.2	55.56	49.8	8.35	39.4	33.14	36.7
Dec. 5.7	28.87	37.0	24.10	61.2	56.88	50.4	8.73	37.4	34.38	35.4
15.7	29.38	38.7	24.43	59.2	58.18	51.6	9.12	35.8	35.64	34.7
25.7	29.87	41.0	24.76	57.3	59.40	53.5	9.50	34.4	36.89	34.6
35.7	30.32	43.7	25.08	55.5	60.50	55.9	9.86	33.5	38.08	35.1

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Majoris.			$\eta$ Octantis.			$\beta^3$ Leonis.			$\psi$ Ursæ Majoris.			$\delta$ Leonis.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.	
	h m 10 57	° ' " +62 14		h m 10 59	° ' " -84 5		h m 11 2	° ' " +2 27		h m 11 4	° ' " +44 59		h m 11 9	° ' " +21 1	
Jan. 0.7	59.29	58.5	67.70	14.6	9.29	40.1	25.81	61.6	9.37	56.2					
10.7	59.85	58.8	69.43	17.1	9.59	38.2	26.21	61.2	9.69	54.8					
20.6	60.35	59.6	70.91	20.0	9.86	36.4	26.57	61.3	9.99	53.8					
30.6	60.79	61.0	72.08	23.3	10.09	34.8	26.88	61.8	10.24	53.1					
Feb. 9.6	61.14	62.8	72.93	26.9	10.27	33.5	27.14	62.8	10.45	52.8					
19.5	61.40	65.0	73.44	30.7	10.41	32.5	27.34	64.2	10.62	52.8					
Mar. 1.5	61.57	67.5	73.60	34.6	10.51	31.7	27.48	65.9	10.73	53.2					
11.5	61.64	70.2	73.43	38.4	10.56	31.2	27.55	67.9	10.80	53.8					
21.5	61.62	72.9	72.93	42.2	10.57	30.9	27.56	70.0	10.82	54.6					
31.4	61.51	75.5	72.12	45.8	10.55	30.8	27.51	72.1	10.79	55.6					
Apr. 10.4	61.33	78.0	71.03	49.2	10.50	30.9	27.42	74.1	10.74	56.7					
20.4	61.09	80.3	69.69	52.2	10.42	31.2	27.29	76.1	10.66	57.9					
30.4	60.81	82.2	68.14	54.8	10.32	31.7	27.13	77.8	10.56	59.0					
May 10.3	60.49	83.7	66.40	57.0	10.21	32.2	26.95	79.3	10.45	60.0					
20.3	60.15	84.7	64.52	58.8	10.10	32.8	26.76	80.4	10.33	61.0					
30.3	59.81	85.3	62.54	60.0	9.99	33.4	26.57	81.2	10.20	61.8					
June 9.2	59.48	85.4	60.51	60.7	9.88	34.1	26.38	81.7	10.08	62.5					
19.2	59.17	85.0	58.47	60.8	9.78	34.8	26.21	81.8	9.97	63.0					
29.2	58.88	84.2	56.47	60.4	9.68	35.4	26.05	81.5	9.86	63.3					
July 9.2	58.63	82.9	54.58	59.4	9.60	36.1	25.91	80.8	9.77	63.4					
19.1	58.42	81.2	52.83	57.9	9.53	36.7	25.79	79.8	9.70	63.4					
29.1	58.26	79.1	51.29	55.9	9.48	37.2	25.70	78.4	9.64	63.1					
Aug. 8.1	58.15	76.7	50.00	53.6	9.44	37.7	25.64	76.8	9.60	62.6					
18.1	58.09	74.0	49.01	50.9	9.43	38.0	25.61	74.9	9.59	61.9					
28.0	58.09	71.1	48.35	47.9	9.45	38.2	25.62	72.7	9.60	61.0					
Sept. 7.0	58.16	68.0	48.05	44.8	9.49	38.2	25.67	70.3	9.64	59.9					
17.0	58.29	64.7	48.13	41.7	9.56	38.0	25.76	67.7	9.71	58.6					
26.9	58.49	61.4	48.60	38.6	9.67	37.6	25.90	65.0	9.82	57.1					
Oct. 6.9	58.76	58.1	49.46	35.8	9.81	36.9	26.08	62.2	9.96	55.4					
16.9	59.09	54.9	50.66	33.3	9.99	35.9	26.31	59.4	10.15	53.5					
26.9	59.49	51.9	52.18	31.2	10.21	34.7	26.59	56.6	10.37	51.5					
Nov. 5.8	59.96	49.0	53.96	29.6	10.46	33.2	26.92	53.9	10.63	49.3					
15.8	60.48	46.5	55.95	28.6	10.74	31.5	27.28	51.4	10.92	47.1					
25.8	61.04	44.4	58.06	28.2	11.05	29.7	27.68	49.1	11.24	44.9					
Dec. 5.8	61.63	42.7	60.23	28.5	11.37	27.7	28.10	47.1	11.58	42.8					
15.7	62.24	41.5	62.37	29.5	11.70	25.6	28.53	45.4	11.93	40.8					
25.7	62.84	40.9	64.41	31.0	12.03	23.5	28.96	44.2	12.28	39.0					
35.7	63.42	40.8	66.27	33.2	12.34	21.4	29.38	43.5	12.62	37.4					



# FIXED STARS, 1907.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Ursæ Majoris.		δ Crateris.		τ Leonis.		λ Draconis.		ξ Hydræ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m II 13	° ' " +33 35	h m II 14	° ' " -14 16	h m II 23	° ' " + 3 21	h m II 25	° ' " +69 50	h m II 28	° ' " -31 20
Jan. 0.7	26.93	59.5	41.14	22.8	8.83	68.9	52.80	26.0	25.41	21.1
10.7	27.28	58.6	41.45	25.1	9.14	66.9	53.54	26.2	25.74	23.7
20.7	27.61	58.1	41.72	27.5	9.42	65.1	54.23	27.0	26.04	26.4
30.6	27.89	58.0	41.96	29.8	9.67	63.6	54.84	28.4	26.30	29.2
Feb. 9.6	28.13	58.4	42.15	31.9	9.88	62.3	55.35	30.3	26.52	32.0
19.6	28.31	59.1	42.30	33.9	10.04	61.3	55.75	32.6	26.69	34.8
Mar. 1.5	28.44	60.2	42.41	35.7	10.16	60.5	56.03	35.2	26.81	37.4
11.5	28.52	61.6	42.47	37.2	10.23	60.0	56.18	38.1	26.88	39.9
21.5	28.54	63.1	42.49	38.3	10.26	59.8	56.21	41.0	26.91	42.2
31.5	28.52	64.7	42.47	39.5	10.26	59.8	56.12	43.9	26.90	44.4
Apr. 10.4	28.46	66.4	42.42	40.3	10.23	60.0	55.93	46.7	26.85	45.9
20.4	28.37	68.0	42.35	40.9	10.17	60.3	55.64	49.2	26.78	47.4
30.4	28.25	69.6	42.26	41.2	10.09	60.8	55.28	51.4	26.68	48.5
May 10.4	28.11	70.9	42.15	41.2	9.99	61.3	54.86	53.2	26.56	49.3
20.3	27.97	72.1	42.04	41.1	9.89	61.9	54.40	54.5	26.43	49.8
30.3	27.82	73.0	41.93	40.8	9.78	62.6	53.92	55.4	26.29	50.0
June 9.3	27.67	73.6	41.81	40.2	9.68	63.3	53.43	55.7	26.14	49.8
19.2	27.54	74.0	41.70	39.5	9.57	64.0	52.95	55.4	25.99	49.3
29.2	27.41	74.0	41.59	38.7	9.47	64.6	52.50	54.7	25.85	48.6
July 9.2	27.30	73.8	41.49	37.7	9.38	65.2	52.09	53.4	25.72	47.5
19.2	27.20	73.3	41.40	36.6	9.30	65.8	51.72	51.7	25.59	46.2
29.1	27.12	72.5	41.33	35.5	9.24	66.3	51.40	49.6	25.48	44.7
Aug. 8.1	27.07	71.4	41.28	34.3	9.19	66.7	51.15	47.0	25.39	43.0
18.1	27.05	70.1	41.24	33.2	9.16	66.9	50.98	44.2	25.32	41.2
28.1	27.05	68.5	41.24	32.1	9.16	67.0	50.88	41.1	25.28	39.4
Sept. 7.0	27.09	66.7	41.26	31.1	9.18	67.0	50.86	37.7	25.28	37.6
17.0	27.16	64.7	41.32	30.3	9.23	66.7	50.93	34.2	25.32	35.9
27.0	27.27	62.5	41.41	29.8	9.32	66.2	51.10	30.7	25.40	34.4
Oct. 6.9	27.42	60.1	41.54	29.5	9.44	65.4	51.36	27.1	25.52	33.2
16.9	27.62	57.7	41.71	29.5	9.60	64.4	51.71	23.6	25.69	32.3
26.9	27.85	55.2	41.92	29.9	9.80	63.1	52.16	20.2	25.91	31.8
Nov. 5.9	28.13	52.6	42.17	30.7	10.04	61.6	52.69	17.1	26.18	31.8
15.8	28.45	50.1	42.45	31.8	10.31	59.9	53.31	14.3	26.48	32.2
25.8	28.79	47.8	42.76	33.3	10.61	58.0	53.99	11.9	26.81	33.1
Dec. 5.8	29.16	45.7	43.09	35.1	10.93	55.9	54.73	10.0	27.16	34.4
15.7	29.54	43.8	43.42	37.1	11.26	53.8	55.50	8.6	27.52	36.2
25.7	29.92	42.2	43.75	39.3	11.59	51.7	56.28	7.7	27.88	38.3
35.7	30.29	41.0	44.07	41.7	11.91	49.7	57.04	7.5	28.23	40.7

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\nu$ Leonis.		$\chi$ Ursæ Majoris.		$\beta$ Leonis.		$\gamma$ Ursæ Majoris.		$\pi$ Virginis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 11 32	° ' 0 18	h m 11 41	° ' 48 17	h m 11 44	° ' 15 5	h m 11 48	° ' 54 12	h m 11 56	° ' 7 7
Jan. 0.7	10.74	33.1	7.81	31.8	18.37	29.8	55.71	31.0	5.76	60.1
10.7	11.05	35.2	8.24	31.1	18.70	28.1	56.19	30.4	6.08	58.2
20.7	11.34	37.1	8.65	30.9	19.00	26.7	56.65	30.4	6.38	56.5
30.6	11.59	38.8	9.01	31.3	19.27	25.6	57.06	30.9	6.65	55.0
Feb. 9.6	11.80	40.3	9.33	32.2	19.50	24.8	57.42	32.0	6.89	53.8
19.6	11.97	41.6	9.58	33.5	19.69	24.4	57.71	33.6	7.08	52.9
Mar. 1.6	12.09	42.6	9.77	35.2	19.83	24.3	57.93	35.5	7.23	52.3
11.5	12.17	43.3	9.89	37.3	19.93	24.5	58.08	37.8	7.34	52.0
21.5	12.22	43.8	9.95	39.5	19.99	25.0	58.15	40.2	7.41	52.0
31.5	12.22	44.0	9.95	41.8	20.00	25.6	58.16	42.8	7.44	52.2
Apr. 10.4	12.19	44.0	9.90	44.2	19.98	26.5	58.10	45.3	7.44	52.6
20.4	12.14	43.8	9.80	46.4	19.94	27.4	57.99	47.7	7.40	53.2
30.4	12.07	43.5	9.66	48.5	19.87	28.4	57.83	50.0	7.35	53.9
May 10.4	11.98	43.1	9.49	50.3	19.78	29.4	57.64	51.9	7.27	54.6
20.3	11.88	42.6	9.30	51.8	19.68	30.4	57.42	53.5	7.18	55.4
30.3	11.78	42.0	9.10	53.0	19.57	31.3	57.18	54.7	7.09	56.2
June 9.3	11.67	41.3	8.89	53.7	19.46	32.1	56.94	55.5	6.99	56.9
19.3	11.57	40.6	8.69	54.0	19.35	32.8	56.69	55.9	6.88	57.6
29.2	11.47	40.0	8.50	54.0	19.24	33.3	56.45	55.8	6.78	58.3
July 9.2	11.38	39.3	8.32	53.5	19.14	33.7	56.23	55.2	6.68	58.8
19.2	11.29	38.6	8.15	52.6	19.05	33.9	56.03	54.2	6.59	59.2
29.1	11.22	38.0	8.01	51.4	18.97	34.0	55.85	52.8	6.50	59.6
Aug. 8.1	11.16	37.5	7.90	49.8	18.90	33.8	55.70	51.0	6.43	59.8
18.1	11.12	37.0	7.82	47.8	18.85	33.5	55.58	48.8	6.37	59.9
28.1	11.11	36.7	7.77	45.6	18.83	32.9	55.51	46.3	6.34	59.7
Sept. 7.0	11.12	36.6	7.76	43.1	18.83	32.1	55.48	43.6	6.33	59.4
17.0	11.16	36.6	7.79	40.3	18.86	31.2	55.50	40.6	6.35	58.9
27.0	11.24	36.9	7.88	37.4	18.93	30.0	55.58	37.5	6.40	58.2
Oct. 7.0	11.35	37.5	8.01	34.4	19.03	28.5	55.71	34.2	6.49	57.2
16.9	11.51	38.3	8.20	31.3	19.17	26.8	55.90	30.9	6.63	55.9
26.9	11.70	39.4	8.44	28.2	19.36	24.9	56.15	27.6	6.80	54.4
Nov. 5.9	11.93	40.7	8.74	25.1	19.59	22.9	56.46	24.4	7.01	52.7
15.9	12.20	42.3	9.08	22.2	19.85	20.7	56.83	21.4	7.26	50.8
25.8	12.49	44.1	9.46	19.6	20.14	18.5	57.25	18.6	7.55	48.8
Dec. 5.8	12.81	46.1	9.88	17.2	20.46	16.3	57.71	16.2	7.86	46.6
15.8	13.14	48.2	10.33	15.2	20.80	14.1	58.19	14.2	8.18	44.4
25.7	13.47	50.4	10.78	13.6	21.14	12.0	58.69	12.7	8.52	42.3
35.7	13.79	52.5	11.23	12.6	21.47	10.1	59.19	11.7	8.85	40.3

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Virginis.		ε Corvi.		4 Draconis (H.).		γ Corvi.		2 Canum Venat.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 12 0	° ' " + 9 14	h m 12 5	° ' " - 22 5	h m 12 7	° ' " + 78 7	h m 12 11	° ' " - 17 1	h m 12 11	° ' " + 41 10
Jan. 0.7	27.63	59.1	19.88	57.2	49.37	44.6	0.69	21.3	27.21	31.4
10.7	27.95	57.2	20.22	59.5	50.57	44.4	1.02	23.6	27.61	30.2
20.7	28.25	55.5	20.53	61.9	51.73	44.9	1.33	25.9	27.99	29.5
30.7	28.53	54.1	20.81	64.3	52.79	46.0	1.61	28.2	28.34	29.3
Feb. 9.6	28.77	53.0	21.05	66.7	53.73	47.7	1.85	30.3	28.65	29.6
19.6	28.97	52.2	21.25	69.0	54.51	49.9	2.06	32.4	28.92	30.4
Mar. 1.6	29.12	51.8	21.41	71.2	55.12	52.5	2.22	34.3	29.13	31.6
11.5	29.24	51.6	21.53	73.2	55.53	55.4	2.34	36.0	29.28	33.2
21.5	29.31	51.7	21.60	74.9	55.73	58.5	2.42	37.5	29.38	35.1
31.5	29.34	52.1	21.64	76.5	55.74	61.6	2.46	38.8	29.42	37.2
Apr. 10.5	29.34	52.6	21.64	77.8	55.55	64.6	2.47	39.8	29.41	39.3
20.4	29.31	53.3	21.61	78.8	55.18	67.5	2.45	40.6	29.36	41.5
30.4	29.25	54.1	21.56	79.6	54.66	70.0	2.41	41.1	29.28	43.5
May 10.4	29.18	54.9	21.49	80.2	54.01	72.2	2.34	41.5	29.17	45.4
20.4	29.10	55.7	21.40	80.5	53.26	73.9	2.26	41.6	29.03	47.1
30.3	29.00	56.5	21.29	80.6	52.43	75.1	2.17	41.5	28.88	48.5
June 9.3	28.90	57.3	21.18	80.4	51.56	75.8	2.06	41.3	28.72	49.6
19.3	28.79	58.1	21.06	80.1	50.67	75.9	1.95	40.8	28.55	50.3
29.2	28.69	58.7	20.94	79.5	49.79	75.5	1.84	40.2	28.38	50.6
July 9.2	28.59	59.2	20.82	78.7	48.94	74.5	1.72	39.5	28.22	50.6
19.2	28.49	59.6	20.70	77.7	48.14	73.0	1.61	38.6	28.06	50.2
29.2	28.40	59.9	20.59	76.6	47.41	71.0	1.51	37.6	27.92	49.4
Aug. 8.1	28.33	60.0	20.49	75.4	46.78	68.6	1.41	36.6	27.79	48.2
18.1	28.27	60.0	20.41	74.1	46.25	65.8	1.33	35.5	27.69	46.7
28.1	28.23	59.8	20.35	72.8	45.84	62.7	1.27	34.4	27.62	44.9
Sept. 7.1	28.21	59.3	20.32	71.6	45.56	59.3	1.24	33.5	27.58	42.8
17.0	28.23	58.7	20.32	70.5	45.42	55.7	1.24	32.6	27.57	40.4
27.0	28.28	57.8	20.36	69.5	45.43	51.9	1.27	31.9	27.61	37.8
Oct. 7.0	28.36	56.7	20.44	68.7	45.60	48.1	1.35	31.4	27.69	35.0
16.9	28.49	55.3	20.57	68.2	45.94	44.3	1.47	31.2	27.82	32.1
26.9	28.66	53.7	20.74	68.1	46.44	40.7	1.63	31.4	28.00	29.0
Nov. 5.9	28.87	51.9	20.96	68.3	47.09	37.2	1.84	31.9	28.23	26.0
15.9	29.12	49.9	21.22	68.9	47.90	34.0	2.09	32.7	28.51	23.0
25.8	29.40	47.8	21.52	69.9	48.85	31.2	2.38	33.9	28.84	20.1
Dec. 5.8	29.71	45.6	21.84	71.3	49.91	28.8	2.69	35.4	29.21	17.5
15.8	30.03	43.4	22.18	73.0	51.05	27.0	3.02	37.2	29.60	15.1
25.8	30.37	41.3	22.53	75.0	52.25	25.8	3.36	39.2	30.00	13.1
35.7	30.70	39.2	22.87	77.2	53.47	25.2	3.70	41.4	30.41	11.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Chamæleontis.		$\eta$ Virginis.		$\alpha^1$ Crucis.		$\delta^2$ Corvi.		$\beta$ Canum Venat.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 12 12	° ' 47	h m 12 15	° ' 8	h m 12 21	° ' 34	h m 12 25	° ' 59	h m 12 29	° ' 51
	s	"	s	"	s	"	s	"	s	"
Jan. 0.7	54.04	19.4	8.14	55.4	25.06	37.9	2.36	41.3	18.67	37.4
10.7	55.22 <sup>1.18</sup>	21.1 <sup>1.7</sup>	8.46 <sup>.32</sup>	57.5 <sup>2.1</sup>	25.63 <sup>.57</sup>	39.8 <sup>1.9</sup>	2.69 <sup>.33</sup>	43.5 <sup>2.2</sup>	19.07 <sup>.40</sup>	36.1 <sup>1.3</sup>
20.7	56.31 <sup>1.09</sup>	23.3 <sup>2.2</sup>	8.76 <sup>.30</sup>	59.4 <sup>1.9</sup>	26.16 <sup>.53</sup>	42.2 <sup>2.4</sup>	3.00 <sup>.31</sup>	45.7 <sup>2.3</sup>	19.46 <sup>.39</sup>	35.2 <sup>0.9</sup>
30.7	57.29 <sup>0.98</sup>	26.1 <sup>2.8</sup>	9.04 <sup>.28</sup>	61.2 <sup>1.8</sup>	26.64 <sup>.48</sup>	45.0 <sup>2.8</sup>	3.29 <sup>.29</sup>	48.0 <sup>2.2</sup>	19.82 <sup>.36</sup>	34.9 <sup>0.3</sup>
Feb. 9.6	58.13 <sup>0.84</sup>	29.2 <sup>3.1</sup>	9.29 <sup>.25</sup>	62.8 <sup>1.6</sup>	27.06 <sup>.42</sup>	48.0 <sup>3.0</sup>	3.54 <sup>.25</sup>	50.1 <sup>2.1</sup>	20.15 <sup>.33</sup>	35.1 <sup>0.2</sup>
	58.13 <sup>0.69</sup>	29.2 <sup>3.4</sup>	9.29 <sup>.21</sup>	62.8 <sup>1.3</sup>	27.06 <sup>.35</sup>	48.0 <sup>3.3</sup>	3.54 <sup>.22</sup>	50.1 <sup>2.0</sup>	20.15 <sup>.28</sup>	35.1 <sup>0.7</sup>
19.6	58.82	32.6	9.50	64.1	27.41	51.3	3.76	52.1	20.43	35.8
Mar. 1.6	59.35 <sup>0.53</sup>	36.2 <sup>3.6</sup>	9.66 <sup>.16</sup>	65.1 <sup>1.0</sup>	27.69 <sup>.28</sup>	54.8 <sup>3.5</sup>	3.94 <sup>.18</sup>	54.0 <sup>1.9</sup>	20.66 <sup>.23</sup>	37.0 <sup>1.2</sup>
11.5	59.70 <sup>0.35</sup>	40.0 <sup>3.8</sup>	9.79 <sup>.13</sup>	65.8 <sup>0.7</sup>	27.89 <sup>.20</sup>	58.3 <sup>3.5</sup>	4.08 <sup>.14</sup>	55.6 <sup>1.6</sup>	20.83 <sup>.17</sup>	38.6 <sup>1.6</sup>
21.5	59.88 <sup>0.18</sup>	43.8 <sup>3.8</sup>	9.87 <sup>.08</sup>	66.3 <sup>0.5</sup>	28.02 <sup>.13</sup>	61.8 <sup>3.5</sup>	4.17 <sup>.09</sup>	57.0 <sup>1.4</sup>	20.95 <sup>.12</sup>	40.4 <sup>1.8</sup>
31.5	59.89 <sup>0.01</sup>	47.6 <sup>3.8</sup>	9.92 <sup>.05</sup>	66.5 <sup>0.2</sup>	28.07 <sup>.05</sup>	65.2 <sup>3.4</sup>	4.23 <sup>.06</sup>	58.2 <sup>1.2</sup>	21.01 <sup>.06</sup>	42.5 <sup>2.1</sup>
	59.89 <sup>0.16</sup>	47.6 <sup>3.6</sup>	9.92 <sup>.02</sup>	66.5 <sup>0.0</sup>	28.07 <sup>.01</sup>	65.2 <sup>3.3</sup>	4.23 <sup>.02</sup>	58.2 <sup>1.0</sup>	21.01 <sup>.02</sup>	42.5 <sup>2.3</sup>
Apr. 10.5	59.73	51.2	9.94	66.5	28.06	68.5	4.25	59.2	21.03	44.8
20.4	59.42 <sup>0.31</sup>	54.7 <sup>3.5</sup>	9.92 <sup>.02</sup>	66.4 <sup>0.1</sup>	27.98 <sup>.08</sup>	71.5 <sup>3.0</sup>	4.25 <sup>.00</sup>	59.9 <sup>0.7</sup>	21.00 <sup>.03</sup>	47.0 <sup>2.2</sup>
30.4	58.97 <sup>0.45</sup>	57.9 <sup>3.2</sup>	9.88 <sup>.04</sup>	66.0 <sup>0.4</sup>	27.85 <sup>.13</sup>	74.3 <sup>2.8</sup>	4.22 <sup>.03</sup>	60.5 <sup>0.6</sup>	20.93 <sup>.07</sup>	49.2 <sup>2.2</sup>
May 10.4	58.38 <sup>0.59</sup>	60.7 <sup>2.8</sup>	9.82 <sup>.06</sup>	65.6 <sup>0.4</sup>	27.66 <sup>.19</sup>	76.7 <sup>2.4</sup>	4.16 <sup>.06</sup>	60.8 <sup>0.3</sup>	20.83 <sup>.10</sup>	51.3 <sup>2.1</sup>
20.4	57.68 <sup>0.70</sup>	63.2 <sup>2.5</sup>	9.75 <sup>.07</sup>	65.0 <sup>0.6</sup>	27.43 <sup>.23</sup>	78.7 <sup>2.0</sup>	4.09 <sup>.07</sup>	60.9 <sup>0.1</sup>	20.70 <sup>.13</sup>	53.1 <sup>1.8</sup>
	57.68 <sup>0.81</sup>	63.2 <sup>2.0</sup>	9.75 <sup>.08</sup>	65.0 <sup>0.6</sup>	27.43 <sup>.27</sup>	78.7 <sup>1.6</sup>	4.09 <sup>.08</sup>	60.9 <sup>0.1</sup>	20.70 <sup>.15</sup>	53.1 <sup>1.6</sup>
30.3	56.87	65.2	9.67	64.4	27.16	80.3	4.01	60.8	20.55	54.7
June 9.3	55.99 <sup>0.88</sup>	66.7 <sup>1.5</sup>	9.57 <sup>.10</sup>	63.8 <sup>0.6</sup>	26.85 <sup>.31</sup>	81.5 <sup>1.2</sup>	3.91 <sup>.10</sup>	60.6 <sup>0.2</sup>	20.39 <sup>.16</sup>	55.9 <sup>1.2</sup>
19.3	55.04 <sup>0.95</sup>	67.7 <sup>1.0</sup>	9.47 <sup>.10</sup>	63.1 <sup>0.7</sup>	26.52 <sup>.33</sup>	82.2 <sup>0.7</sup>	3.80 <sup>.11</sup>	60.2 <sup>0.4</sup>	20.22 <sup>.17</sup>	56.8 <sup>0.9</sup>
29.2	54.06 <sup>0.98</sup>	68.2 <sup>0.5</sup>	9.37 <sup>.10</sup>	62.5 <sup>0.6</sup>	26.17 <sup>.35</sup>	82.4 <sup>0.2</sup>	3.69 <sup>.11</sup>	59.7 <sup>0.5</sup>	20.04 <sup>.18</sup>	57.3 <sup>0.5</sup>
July 9.2	53.07 <sup>0.99</sup>	68.1 <sup>0.1</sup>	9.26 <sup>.11</sup>	61.8 <sup>0.7</sup>	25.81 <sup>.36</sup>	82.1 <sup>0.3</sup>	3.58 <sup>.11</sup>	59.0 <sup>0.7</sup>	19.87 <sup>.17</sup>	57.4 <sup>0.1</sup>
	53.07 <sup>0.98</sup>	68.1 <sup>0.7</sup>	9.26 <sup>.10</sup>	61.8 <sup>0.6</sup>	25.81 <sup>.36</sup>	82.1 <sup>0.8</sup>	3.58 <sup>.12</sup>	59.0 <sup>0.8</sup>	19.87 <sup>.17</sup>	57.4 <sup>0.3</sup>
19.2	52.09	67.4	9.16	61.2	25.45	81.3	3.46	58.2	19.70	57.1
29.2	51.16 <sup>0.93</sup>	66.3 <sup>1.1</sup>	9.07 <sup>.09</sup>	60.7 <sup>0.5</sup>	25.11 <sup>.34</sup>	80.1 <sup>1.2</sup>	3.35 <sup>.11</sup>	57.3 <sup>0.9</sup>	19.54 <sup>.16</sup>	56.4 <sup>0.7</sup>
Aug. 8.1	50.31 <sup>0.85</sup>	64.6 <sup>1.7</sup>	8.98 <sup>.09</sup>	60.2 <sup>0.5</sup>	24.80 <sup>.31</sup>	78.4 <sup>1.7</sup>	3.25 <sup>.10</sup>	56.3 <sup>1.0</sup>	19.40 <sup>.14</sup>	55.3 <sup>1.1</sup>
18.1	49.56 <sup>0.75</sup>	62.5 <sup>2.1</sup>	8.91 <sup>.07</sup>	59.8 <sup>0.4</sup>	24.52 <sup>.28</sup>	76.4 <sup>2.0</sup>	3.16 <sup>.09</sup>	55.4 <sup>0.9</sup>	19.27 <sup>.13</sup>	53.9 <sup>1.4</sup>
28.1	48.95 <sup>0.61</sup>	60.0 <sup>2.5</sup>	8.86 <sup>.05</sup>	59.5 <sup>0.3</sup>	24.29 <sup>.23</sup>	74.1 <sup>2.3</sup>	3.09 <sup>.07</sup>	54.4 <sup>1.0</sup>	19.17 <sup>.10</sup>	52.2 <sup>1.7</sup>
	48.95 <sup>0.44</sup>	60.0 <sup>2.8</sup>	8.86 <sup>.03</sup>	59.5 <sup>0.1</sup>	24.29 <sup>.17</sup>	74.1 <sup>2.6</sup>	3.09 <sup>.04</sup>	54.4 <sup>0.9</sup>	19.17 <sup>.07</sup>	52.2 <sup>2.1</sup>
Sept. 7.1	48.51	57.2	8.83	59.4	24.12	71.5	3.05	53.5	19.10	50.1
17.0	48.24 <sup>0.27</sup>	54.2 <sup>3.0</sup>	8.83 <sup>.00</sup>	59.5 <sup>0.1</sup>	24.03 <sup>.09</sup>	68.8 <sup>2.7</sup>	3.03 <sup>.02</sup>	52.7 <sup>0.8</sup>	19.07 <sup>.03</sup>	47.7 <sup>2.4</sup>
27.0	48.18 <sup>0.06</sup>	51.2 <sup>3.0</sup>	8.87 <sup>.04</sup>	59.9 <sup>0.4</sup>	24.02 <sup>.01</sup>	66.1 <sup>2.7</sup>	3.05 <sup>.02</sup>	52.1 <sup>0.6</sup>	19.08 <sup>.01</sup>	45.1 <sup>2.6</sup>
Oct. 7.0	48.32 <sup>0.14</sup>	48.2 <sup>3.0</sup>	8.94 <sup>.07</sup>	60.4 <sup>0.5</sup>	24.09 <sup>.07</sup>	63.4 <sup>2.7</sup>	3.11 <sup>.06</sup>	51.7 <sup>0.4</sup>	19.14 <sup>.06</sup>	42.3 <sup>2.8</sup>
16.9	48.68 <sup>0.36</sup>	45.3 <sup>2.9</sup>	9.05 <sup>.11</sup>	61.2 <sup>0.8</sup>	24.26 <sup>.17</sup>	61.0 <sup>2.4</sup>	3.22 <sup>.11</sup>	51.6 <sup>0.1</sup>	19.24 <sup>.10</sup>	39.3 <sup>3.0</sup>
	48.68 <sup>0.57</sup>	45.3 <sup>2.6</sup>	9.05 <sup>.15</sup>	61.2 <sup>1.1</sup>	24.26 <sup>.26</sup>	61.0 <sup>2.2</sup>	3.22 <sup>.15</sup>	51.6 <sup>0.1</sup>	19.24 <sup>.16</sup>	39.3 <sup>3.1</sup>
26.9	49.25	42.7	9.20	62.3	24.52	58.8	3.37	51.7	19.40	36.2
Nov. 5.9	49.25 <sup>0.76</sup>	40.5 <sup>2.2</sup>	9.40 <sup>.20</sup>	63.7 <sup>1.4</sup>	24.87 <sup>.35</sup>	57.1 <sup>1.7</sup>	3.57 <sup>.20</sup>	52.2 <sup>0.5</sup>	19.61 <sup>.21</sup>	33.0 <sup>3.2</sup>
15.9	50.01 <sup>0.92</sup>	38.8 <sup>1.7</sup>	9.64 <sup>.24</sup>	65.3 <sup>1.6</sup>	25.29 <sup>.42</sup>	55.8 <sup>1.3</sup>	3.81 <sup>.24</sup>	53.0 <sup>0.8</sup>	19.87 <sup>.26</sup>	29.9 <sup>3.1</sup>
25.8	50.93 <sup>1.05</sup>	37.7 <sup>1.1</sup>	9.91 <sup>.27</sup>	67.1 <sup>1.8</sup>	25.78 <sup>.49</sup>	55.0 <sup>0.8</sup>	4.08 <sup>.27</sup>	54.2 <sup>1.2</sup>	20.18 <sup>.31</sup>	26.9 <sup>3.0</sup>
Dec. 5.8	51.98 <sup>1.16</sup>	37.1 <sup>0.6</sup>	10.21 <sup>.30</sup>	69.1 <sup>2.0</sup>	26.33 <sup>.55</sup>	54.9 <sup>0.1</sup>	4.39 <sup>.31</sup>	55.7 <sup>1.5</sup>	20.53 <sup>.35</sup>	24.1 <sup>2.8</sup>
	53.14 <sup>1.22</sup>	37.1 <sup>0.1</sup>	10.21 <sup>.32</sup>	69.1 <sup>2.1</sup>	26.33 <sup>.57</sup>	54.9 <sup>0.5</sup>	4.39 <sup>.33</sup>	55.7 <sup>1.8</sup>	20.53 <sup>.38</sup>	24.1 <sup>2.5</sup>
15.8	54.36	37.2	10.53	71.2	26.90	55.4	4.72	57.5	20.91	21.6
25.8	55.59 <sup>1.23</sup>	37.9 <sup>0.7</sup>	10.86 <sup>.33</sup>	73.4 <sup>2.2</sup>	27.49 <sup>.59</sup>	56.4 <sup>1.0</sup>	5.05 <sup>.33</sup>	59.5 <sup>2.0</sup>	21.31 <sup>.40</sup>	19.5 <sup>2.1</sup>
35.7	56.80 <sup>1.21</sup>	39.2 <sup>1.3</sup>	11.19 <sup>.33</sup>	75.5 <sup>2.1</sup>	28.07 <sup>.58</sup>	58.0 <sup>1.6</sup>	5.39 <sup>.34</sup>	61.6 <sup>2.1</sup>	21.72 <sup>.41</sup>	17.8 <sup>1.7</sup>

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Corvi.		$\alpha$ Draconis.		$\gamma$ Virginis (mean).		31 Comæ Berenices.		32 <sup>d</sup> Camelop. (H.).	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 12 29	° ' " -22 52	h m 12 29	° ' " +70 17	h m 12 36	° ' " - 0 56	h m 12 47	° ' " +28 2	h m 12 48	° ' " +83 54
Jan. 0.7	29.27	44.1	29.49	49.6	56.03	16.5	9.07	43.8	21.85	52.6
10.7	29.61	46.3	30.26	48.9	56.36	18.6	9.43	42.0	24.07	52.0
20.7	29.94	48.6	31.01	48.9	56.67	20.6	9.78	40.6	26.27	52.0
30.7	30.24	50.9	31.72	49.5	56.96	22.4	10.10	39.6	28.38	52.7
Feb. 9.6	30.50	53.3	32.36	50.7	57.22	24.0	10.40	39.1	30.32	54.1
19.6	30.73	55.6	32.90	52.5	57.44	25.3	10.66	39.1	32.02	56.0
Mar. 1.6	30.91	57.7	33.34	54.7	57.62	26.4	10.88	39.5	33.43	58.4
11.6	31.06	59.7	33.67	57.3	57.77	27.2	11.05	40.3	34.49	61.1
21.5	31.16	61.5	33.87	60.2	57.87	27.7	11.18	41.4	35.19	64.1
31.5	31.22	63.1	33.95	63.2	57.94	28.0	11.26	42.8	35.50	67.2
Apr. 10.5	31.25	64.5	33.92	66.2	57.98	28.0	11.30	44.4	35.42	70.4
20.4	31.25	65.6	33.77	69.1	57.98	27.9	11.31	46.2	34.97	73.4
30.4	31.22	66.5	33.53	71.8	57.96	27.6	11.28	47.9	34.19	76.2
May 10.4	31.16	67.2	33.20	74.2	57.92	27.1	11.23	49.6	33.10	78.7
20.4	31.09	67.6	32.81	76.2	57.86	26.6	11.15	51.2	31.75	80.7
30.3	31.00	67.8	32.37	77.8	57.79	26.0	11.05	52.7	30.20	82.3
June 9.3	30.90	67.8	31.89	78.9	57.70	25.4	10.94	53.9	28.49	83.4
19.3	30.79	67.6	31.39	79.4	57.61	24.7	10.82	54.9	26.68	84.0
29.3	30.67	67.1	30.88	79.4	57.50	24.1	10.69	55.7	24.82	84.0
July 9.2	30.55	66.5	30.38	78.9	57.40	23.4	10.56	56.1	22.96	83.4
19.2	30.42	65.7	29.89	77.9	57.29	22.8	10.42	56.3	21.15	82.2
29.2	30.30	64.7	29.45	76.4	57.18	22.3	10.29	56.1	19.43	80.6
Aug. 8.1	30.18	63.6	29.04	74.4	57.08	21.8	10.17	55.7	17.85	78.5
18.1	30.08	62.4	28.69	71.9	57.00	21.4	10.06	54.9	16.43	75.9
28.1	30.00	61.1	28.40	69.1	56.93	21.1	9.97	53.8	15.22	73.0
Sept. 7.1	29.95	59.9	28.19	66.0	56.88	21.0	9.90	52.5	14.24	69.7
17.0	29.93	58.8	28.06	62.6	56.86	21.1	9.86	50.8	13.51	66.2
27.0	29.94	57.8	28.01	59.0	56.87	21.4	9.86	48.9	13.07	62.4
Oct. 7.0	30.00	57.0	28.07	55.3	56.92	21.9	9.89	46.7	12.92	58.6
17.0	30.10	56.4	28.23	51.5	57.01	22.6	9.97	44.3	13.09	54.7
26.9	30.25	56.2	28.49	47.8	57.14	23.7	10.10	41.7	13.58	50.9
Nov. 5.9	30.45	56.3	28.85	44.2	57.32	25.0	10.27	39.0	14.40	47.2
15.9	30.70	56.8	29.32	40.8	57.54	26.5	10.49	36.2	15.53	43.7
25.8	30.98	57.6	29.89	37.6	57.79	28.3	10.76	33.4	16.96	40.6
Dec. 5.8	31.29	58.8	30.53	34.9	58.08	30.2	11.06	30.7	18.65	37.9
15.8	31.63	60.4	31.24	32.7	58.40	32.3	11.39	28.1	20.57	35.7
25.8	31.98	62.2	32.00	31.0	58.72	34.4	11.74	25.8	22.66	34.0
35.7	32.33	64.3	32.78	29.9	59.05	36.6	12.10	23.7	24.85	32.9

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Canum Venat.			$\delta$ Muscæ.			$\epsilon$ Virginis.			$\theta$ Virginis.			$20$ Canum Venat.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	12 51		+38 48	12 55		-71 2	12 57		+11 27	13 5		-5 2	13 13		+41 3
Jan. 0.8	39.54		66.7	51.15		24.8	31.80		33.3	6.99		26.2	21.13		36.5
10.7	39.93	.39	65.1	51.94	.79	26.1	32.14	.34	31.3	7.32	.33	28.3	21.53	.40	34.7
20.7	40.31	.38	63.9	52.70	.76	27.9	32.46	.32	29.5	7.64	.32	30.3	21.92	.39	33.4
30.7	40.67	.36	63.3	53.41	.71	30.2	32.76	.30	28.0	7.94	.30	32.2	22.30	.38	32.6
Feb. 9.7	41.00	.33	63.2	54.06	.65	33.0	33.04	.28	26.8	8.22	.28	33.9	22.65	.35	32.4
		.29	63.2		.56	33.0		.24	26.8		.24	33.9		.31	32.4
19.6	41.29		63.6	54.62		36.0	33.28		26.0	8.46		35.4	22.96		32.7
Mar. 1.6	41.54	.25	64.5	55.09	.47	39.3	33.49	.21	25.5	8.67	.21	36.7	23.23	.27	33.6
11.6	41.73	.19	65.8	55.47	.38	42.8	33.66	.17	25.4	8.84	.17	37.8	23.46	.23	34.9
21.5	41.87	.14	67.5	55.75	.28	46.4	33.79	.13	25.6	8.98	.14	38.5	23.63	.17	36.6
31.5	41.96	.09	69.4	55.92	.17	50.0	33.88	.09	26.1	9.08	.10	39.0	23.75	.12	38.6
		.05	69.4		.08	50.0		.05	26.1		.07	39.0		.07	38.6
Apr. 10.5	42.01	.00	71.5	56.00	.02	53.5	33.93	.03	26.8	9.15	.03	39.3	23.82	.02	40.8
20.5	42.01	.04	73.7	55.98	.11	56.9	33.96	.01	27.6	9.18	.01	39.4	23.84	.01	43.1
30.4	41.97	.07	75.9	55.87	.19	60.1	33.95	.03	28.6	9.19	.02	39.3	23.83	.06	45.4
May 10.4	41.90	.10	78.0	55.68	.28	63.0	33.92	.05	29.7	9.17	.03	39.1	23.77	.09	47.7
20.4	41.80	.12	79.9	55.40	.35	65.6	33.87	.07	30.8	9.14	.06	38.7	23.68	.11	49.8
30.4	41.68	.14	81.6	55.05	.41	67.8	33.80	.08	31.8	9.08	.07	38.3	23.57	.14	51.7
June 9.3	41.54	.16	83.0	54.64	.46	69.6	33.72	.10	32.8	9.01	.09	37.8	23.43	.15	53.3
19.3	41.38	.16	84.0	54.18	.51	70.9	33.62	.10	33.7	8.92	.10	37.2	23.28	.17	54.5
29.3	41.22	.16	84.7	53.67	.53	71.8	33.52	.11	34.5	8.82	.10	36.6	23.11	.18	55.4
July 9.2	41.06	.17	85.1	53.14	.55	72.1	33.41	.11	35.1	8.72	.11	36.0	22.93	.18	55.9
			85.1			72.1			35.1			36.0			55.9
19.2	40.89	.16	85.1	52.59	.54	71.9	33.30	.12	35.5	8.61	.12	35.4	22.75	.18	56.1
29.2	40.73	.15	84.7	52.05	.52	71.1	33.18	.11	35.8	8.49	.11	34.8	22.57	.17	55.8
Aug. 8.2	40.58	.14	83.9	51.53	.48	69.9	33.07	.10	36.0	8.38	.10	34.2	22.40	.16	55.1
18.1	40.44	.11	82.7	51.05	.42	68.2	32.97	.08	35.9	8.28	.10	33.7	22.24	.15	54.0
28.1	40.33	.09	81.2	50.63	.35	66.1	32.89	.07	35.6	8.18	.07	33.3	22.09	.12	52.5
			81.2			66.1			35.6			33.3			52.5
Sept. 7.1	40.24	.06	79.3	50.28	.24	63.7	32.82	.04	35.1	8.11	.05	33.0	21.97	.08	50.6
17.1	40.18	.02	77.2	50.04	.13	61.0	32.78	.01	34.3	8.06	.01	32.9	21.89	.05	48.5
27.0	40.16	.03	74.7	49.91	.01	58.2	32.77	.02	33.3	8.05	.02	32.9	21.84	.01	46.0
Oct. 7.0	40.19	.07	72.0	49.90	.12	55.4	32.79	.07	32.1	8.07	.06	33.2	21.83	.04	43.2
17.0	40.26	.12	69.1	50.02	.26	52.6	32.86	.11	30.6	8.13	.11	33.7	21.87	.10	40.2
			69.1			52.6			30.6			33.7			40.2
26.9	40.38	.18	66.1	50.28	.38	50.0	32.97	.16	28.9	8.24	.15	34.4	21.97	.15	37.1
Nov. 5.9	40.56	.23	63.0	50.66	.50	47.7	33.13	.20	26.9	8.39	.20	35.5	22.12	.21	33.8
15.9	40.79	.28	59.8	51.16	.60	45.8	33.33	.24	24.8	8.59	.24	36.8	22.33	.25	30.5
25.9	41.07	.32	56.7	51.76	.69	44.4	33.57	.28	22.5	8.83	.28	38.3	22.58	.31	27.3
Dec. 5.8	41.39	.36	53.8	52.45	.75	43.6	33.85	.31	20.2	9.11	.30	40.1	22.89	.35	24.2
			53.8			43.6			20.2			40.1			24.2
15.8	41.75	.38	51.1	53.20	.79	43.3	34.16	.33	17.8	9.41	.32	42.0	23.24	.38	21.3
25.8	42.13	.39	48.8	53.99	.80	43.6	34.49	.33	15.5	9.73	.34	44.1	23.62	.39	18.8
35.8	42.52		46.8	54.79		44.5	34.82		13.3	10.07		46.2	24.01		16.7

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>a</i> Virginis. ( <i>Spica</i> .)		$\kappa$ Octantis.		$\zeta$ Virginis.		B. A. C. 4536.		<i>m</i> Virginis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 13 20	° 10 40	h m 13 25	° 85 18	h m 13 29	° 0 7	h m 13 30	° +37 39	h m 13 36	° 8 13
Jan. 0.8	16.44	24.2	42.48	8.6	56.01	8.1	37.33	25.6	42.56	53.3
10.8	16.77	26.2	45.37	9.1	56.34	10.2	37.71	23.6	42.89	55.3
20.7	17.10	28.2	48.22	10.2	56.66	12.1	38.09	22.0	43.22	57.2
30.7	17.41	30.2	50.96	11.9	56.97	13.9	38.46	21.0	43.53	59.1
Feb. 9.7	17.69	32.1	53.51	14.1	57.26	15.5	38.80	20.5	43.82	60.9
19.6	17.95	33.8	55.82	16.8	57.52	16.9	39.12	20.6	44.08	62.5
Mar. 1.6	18.17	35.3	57.83	19.8	57.75	17.9	39.40	21.2	44.32	63.9
11.6	18.36	36.6	59.51	23.2	57.94	18.7	39.63	22.3	44.52	65.1
21.6	18.51	37.7	60.83	26.7	58.10	19.2	39.81	23.8	44.69	66.0
31.6	18.63	38.5	61.77	30.4	58.22	19.4	39.95	25.6	44.82	66.7
Apr. 10.5	18.71	39.1	62.31	34.1	58.31	19.3	40.04	27.6	44.92	67.1
20.5	18.76	39.5	62.46	37.8	58.37	19.1	40.09	29.8	44.99	67.4
30.5	18.78	39.7	62.21	41.4	58.40	18.7	40.10	32.1	45.03	67.4
May 10.4	18.78	39.8	61.58	44.9	58.40	18.2	40.07	34.3	45.04	67.4
20.4	18.76	39.7	60.57	48.1	58.38	17.6	40.01	36.4	45.03	67.1
30.4	18.71	39.5	59.22	51.0	58.34	16.9	39.92	38.4	44.99	66.8
June 9.3	18.65	39.2	57.55	53.5	58.28	16.2	39.80	40.1	44.94	66.4
19.3	18.57	38.8	55.60	55.5	58.21	15.5	39.67	41.5	44.87	66.0
29.3	18.47	38.3	53.43	57.1	58.12	14.8	39.52	42.5	44.78	65.5
July 9.3	18.36	37.8	51.10	58.1	58.01	14.2	39.36	43.2	44.67	64.9
19.2	18.25	37.2	48.66	58.6	57.90	13.6	39.19	43.6	44.56	64.4
29.2	18.13	36.6	46.19	58.5	57.78	13.0	39.01	43.5	44.44	63.8
Aug. 8.2	18.01	35.9	43.77	57.8	57.66	12.6	38.84	43.0	44.31	63.2
18.2	17.89	35.3	41.48	56.6	57.54	12.3	38.68	42.1	44.19	62.7
28.1	17.79	34.7	39.40	54.9	57.43	12.1	38.53	40.9	44.08	62.2
Sept. 7.1	17.70	34.2	37.61	52.7	57.34	12.0	38.40	39.3	43.98	61.8
17.1	17.64	33.8	36.18	50.1	57.27	12.1	38.30	37.4	43.91	61.5
27.0	17.61	33.5	35.18	47.3	57.23	12.4	38.23	35.1	43.86	61.4
Oct. 7.0	17.61	33.4	34.65	44.3	57.23	13.0	38.20	32.5	43.85	61.4
17.0	17.66	33.5	34.62	41.2	57.27	13.8	38.22	29.7	43.88	61.7
27.0	17.76	33.9	35.11	38.2	57.35	14.8	38.30	26.7	43.96	62.2
Nov. 5.9	17.90	34.6	36.10	35.3	57.48	16.1	38.42	23.5	44.08	63.0
15.9	18.09	35.6	37.57	32.8	57.65	17.6	38.60	20.3	44.25	64.1
25.9	18.32	36.8	39.48	30.7	57.87	19.4	38.84	17.1	44.47	65.4
Dec. 5.9	18.59	38.3	41.75	29.0	58.13	21.3	39.12	13.9	44.73	67.0
15.8	18.89	40.0	44.30	28.0	58.42	23.3	39.44	11.0	45.02	68.7
25.8	19.21	41.9	47.06	27.5	58.73	25.5	39.80	8.3	45.33	70.6
35.8	19.54	43.9	49.93	27.6	59.05	27.6	40.17	6.0	45.66	72.6

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Ursæ Majoris.		η Bootis.		θ Apodis.		β Centauri.		π Hydræ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m	° '	h m	° '	h m	° '	h m	° '	h m	° '
	13 43	+49 46	13 50	+18 51	13 56	-76 20	13 57	-59 55	14 1	-26 13
	s	"	s	"	s	"	s	"	s	"
Jan. 0.8	50.98	29.6	14.03	49.2	12.17	27.6	13.65	5.0	3.01	49.9
10.8	51.42	27.6	14.36	47.0	13.24	27.9	14.21	5.8	3.37	51.4
20.8	51.86	26.2	14.69	45.1	14.32	28.7	14.77	7.0	3.72	53.2
30.7	52.29	25.3	15.02	43.5	15.38	30.1	15.31	8.6	4.06	55.1
Feb. 9.7	52.70	25.0	15.33	42.3	16.39	32.0	15.83	10.7	4.39	57.0
19.7	53.08	25.4	15.61	41.6	17.33	34.4	16.31	13.1	4.69	59.0
Mar. 1.6	53.41	26.3	15.86	41.3	18.17	37.1	16.74	15.7	4.96	60.9
11.6	53.70	27.8	16.08	41.4	18.90	40.1	17.12	18.5	5.20	62.8
21.6	53.93	29.7	16.26	41.9	19.52	43.4	17.44	21.5	5.40	64.5
31.6	54.10	32.0	16.41	42.8	20.02	46.8	17.70	24.5	5.57	66.1
Apr. 10.5	54.22	34.5	16.52	43.9	20.38	50.3	17.90	27.5	5.71	67.6
20.5	54.28	37.2	16.59	45.2	20.61	53.8	18.04	30.5	5.81	68.9
30.5	54.29	39.9	16.63	46.6	20.70	57.2	18.12	33.4	5.88	70.0
May 10.5	54.25	42.5	16.65	48.2	20.66	60.5	18.14	36.1	5.92	71.0
20.4	54.16	45.0	16.63	49.7	20.50	63.6	18.10	38.6	5.93	71.8
30.4	54.04	47.2	16.59	51.2	20.20	66.4	18.01	40.8	5.91	72.4
June 9.4	53.88	49.1	16.53	52.6	19.79	68.9	17.87	42.7	5.87	72.8
19.3	53.69	50.7	16.45	53.8	19.27	71.0	17.68	44.3	5.80	73.1
29.3	53.48	51.9	16.35	54.9	18.66	72.7	17.44	45.5	5.71	73.1
July 9.3	53.26	52.6	16.23	55.7	17.96	73.9	17.17	46.2	5.60	73.0
19.3	53.03	52.9	16.11	56.3	17.21	74.6	16.86	46.5	5.47	72.7
29.2	52.79	52.7	15.97	56.7	16.42	74.8	16.54	46.4	5.32	72.3
Aug. 8.2	52.55	52.0	15.83	56.8	15.62	74.4	16.21	45.8	5.17	71.6
18.2	52.32	50.9	15.70	56.6	14.84	73.4	15.88	44.8	5.02	70.9
28.2	52.11	49.4	15.57	56.1	14.11	72.0	15.57	43.4	4.87	70.0
Sept. 7.1	51.92	47.4	15.45	55.3	13.46	70.1	15.29	41.6	4.74	69.0
17.1	51.76	45.0	15.36	54.3	12.91	67.9	15.06	39.6	4.64	68.0
27.1	51.64	42.3	15.29	53.0	12.50	65.3	14.89	37.4	4.56	67.0
Oct. 7.0	51.57	39.3	15.26	51.4	12.23	62.5	14.80	35.0	4.52	66.1
17.0	51.56	36.0	15.27	49.5	12.14	59.6	14.78	32.6	4.53	65.3
27.0	51.61	32.6	15.33	47.4	12.23	56.7	14.85	30.3	4.59	64.7
Nov. 6.0	51.72	29.1	15.43	45.1	12.51	54.0	15.02	28.1	4.70	64.4
15.9	51.90	25.5	15.58	42.6	12.97	51.5	15.28	26.2	4.86	64.3
25.9	52.14	22.0	15.78	40.0	13.60	49.4	15.62	24.7	5.08	64.5
Dec. 5.9	52.44	18.6	16.02	37.3	14.38	47.7	16.03	23.6	5.34	65.1
15.8	52.79	15.5	16.30	34.7	15.28	46.5	16.50	23.0	5.64	66.0
25.8	53.18	12.7	16.61	32.1	16.28	45.8	17.03	23.0	5.97	67.2
35.8	53.61	10.3	16.94	29.7	17.33	45.8	17.58	23.4	6.32	68.6



# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Draconis.			$\delta$ Bootis.			$\kappa$ Virginis.			$\gamma$ Ursæ Minoris.			$\alpha$ Bootis. ( <i>Arcturus</i> .)		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.	
	h m 14 1	° ' " +64 48		h m 14 6	° ' " +25 31		h m 14 7	° ' " - 9 50		h m 14 9	° ' " +77 58		h m 14 11	° ' " +19 39	
Jan. 0.8	50.00	62.5	8.09	53.1	54.62	18.4	7.94	53.2	23.67	58.8					
10.8	50.59	60.5	8.43	50.8	54.94	20.3	9.00	51.3	23.99	56.5					
20.8	51.20	59.1	8.77	48.9	55.27	22.2	10.13	50.1	24.32	54.5					
30.7	51.81	58.4	9.11	47.4	55.59	24.1	11.28	49.6	24.65	52.8					
Feb. 9.7	52.40	58.3	9.43	46.3	55.89	25.8	12.41	49.7	24.96	51.5					
19.7	52.95	58.9	9.73	45.7	56.18	27.4	13.48	50.5	25.25	50.7					
Mar. 1.7	53.45	60.1	10.00	45.6	56.43	28.8	14.45	51.9	25.51	50.3					
11.6	53.89	61.9	10.24	46.0	56.66	29.9	15.30	53.8	25.75	50.3					
21.6	54.24	64.1	10.44	46.8	56.85	30.8	15.99	56.2	25.95	50.8					
31.6	54.51	66.7	10.61	47.9	57.02	31.6	16.51	59.0	26.11	51.6					
Apr. 10.5	54.69	69.6	10.74	49.3	57.15	32.1	16.85	62.0	26.24	52.7					
20.5	54.78	72.6	10.83	51.0	57.25	32.4	17.00	65.1	26.33	54.0					
30.5	54.79	75.6	10.88	52.9	57.32	32.5	16.96	68.2	26.39	55.5					
May 10.5	54.72	78.6	10.90	54.8	57.36	32.5	16.75	71.2	26.42	57.0					
20.4	54.57	81.4	10.89	56.6	57.38	32.4	16.37	74.0	26.42	58.6					
30.4	54.35	83.9	10.86	58.4	57.37	32.1	15.84	76.5	26.40	60.2					
June 9.4	54.07	86.0	10.80	60.1	57.34	31.8	15.18	78.6	26.35	61.7					
19.4	53.75	87.7	10.71	61.6	57.29	31.4	14.42	80.3	26.27	63.0					
29.3	53.39	88.9	10.61	62.8	57.21	31.0	13.57	81.5	26.17	64.1					
July 9.3	52.99	89.7	10.49	63.7	57.11	30.5	12.66	82.1	26.06	65.0					
19.3	52.58	90.0	10.35	64.4	57.00	29.9	11.71	82.2	25.93	65.7					
29.2	52.15	89.7	10.20	64.8	56.88	29.4	10.74	81.8	25.79	66.1					
Aug. 8.2	51.73	88.9	10.04	64.9	56.75	28.9	9.78	80.8	25.65	66.2					
18.2	51.32	87.6	9.89	64.6	56.61	28.4	8.85	79.3	25.50	66.0					
28.2	50.94	85.8	9.74	64.0	56.48	27.9	7.97	77.4	25.35	65.6					
Sept. 7.1	50.59	83.6	9.60	63.1	56.36	27.5	7.16	75.0	25.22	64.8					
17.1	50.28	81.0	9.49	61.8	56.26	27.2	6.45	72.2	25.11	63.8					
27.1	50.04	78.0	9.40	60.2	56.19	27.0	5.85	69.0	25.02	62.5					
Oct. 7.1	49.86	74.6	9.35	58.3	56.15	27.0	5.39	65.5	24.96	60.8					
17.0	49.76	71.0	9.34	56.1	56.15	27.1	5.08	61.8	24.95	58.9					
27.0	49.74	67.3	9.37	53.7	56.20	27.5	4.93	58.0	24.98	56.8					
Nov. 6.0	49.82	63.4	9.45	51.1	56.29	28.2	4.96	54.1	25.05	54.4					
15.9	49.99	59.6	9.59	48.3	56.44	29.1	5.18	50.2	25.18	51.8					
25.9	50.25	55.8	9.77	45.4	56.63	30.2	5.58	46.4	25.36	49.1					
Dec. 5.9	50.61	52.2	10.00	42.5	56.87	31.6	6.16	42.9	25.58	46.3					
15.9	51.05	49.0	10.28	39.6	57.14	33.2	6.91	39.7	25.84	43.5					
25.8	51.56	46.1	10.59	36.8	57.44	34.9	7.80	36.9	26.13	40.8					
35.8	52.12	43.7	10.91	34.3	57.76	36.8	8.81	34.7	26.45	38.3					

## FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♌ Octantis.		♐ Bootis.		♍ Virginis.		♋ Bootis.		♊ Ursæ Minoris.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 14 11	° ' " -83 14	h m 14 12	° ' " +46 30	h m 14 14	° ' " -12 56	h m 14 21	° ' " +52 16	h m 14 27	° ' " +76 6
Jan. 0.8	51.06 s	7.0 "	49.19 s	47.6 "	3.09 s	25.4 "	59.93 s	41.9 "	38.84 s	24.2 "
10.8	53.10 2.04	6.8 0.2	49.59 40	45.3 2.3	3.42 33	27.2 1.8	60.36 43	39.5 2.4	39.74 0.90	22.1 2.1
20.8	55.19 2.09	7.3 0.5	50.00 41	43.5 1.8	3.75 33	29.0 1.8	60.80 44	37.6 1.9	40.70 0.96	20.6 1.5
30.7	57.26 2.07	8.4 1.1	50.41 41	42.3 1.2	4.07 32	30.8 1.8	61.25 45	36.4 1.2	41.70 1.00	19.7 0.9
Feb. 9.7	59.26 1.89	10.0 2.0	50.81 38	41.7 0.0	4.38 29	32.6 1.6	61.69 42	35.8 0.0	42.70 0.96	19.5 0.5
19.7	61.15 1.73	12.0 2.5	51.19 34	41.7 0.6	4.67 27	34.2 1.5	62.11 38	35.8 0.6	43.66 0.88	20.0 1.2
Mar. 1.7	62.88 1.53	14.5 2.9	51.53 30	42.3 1.1	4.94 23	35.7 1.2	62.49 34	36.4 1.2	44.54 0.79	21.2 1.7
11.6	64.41 1.32	17.4 3.1	51.83 25	43.4 1.6	5.17 20	36.9 1.1	62.83 29	37.6 1.8	45.33 0.67	22.9 2.2
21.6	65.73 1.07	20.5 3.4	52.08 20	45.0 2.0	5.37 17	38.0 0.9	63.12 23	39.4 2.2	46.00 0.52	25.1 2.6
31.6	66.80 0.82	23.9 3.5	52.28 15	47.0 2.4	5.54 14	38.9 0.7	63.35 18	41.6 2.4	46.52 0.36	27.7 2.9
Apr. 10.5	67.62 0.54	27.4 3.6	52.43 10	49.4 2.5	5.68 11	39.6 0.5	63.53 11	44.0 2.7	46.88 0.21	30.6 3.1
20.5	68.16 0.27	31.0 3.6	52.53 05	51.9 2.7	5.79 08	40.1 0.3	63.64 06	46.7 2.8	47.09 0.05	33.7 3.2
30.5	68.43 0.01	34.6 3.5	52.58 01	54.6 2.6	5.87 05	40.4 0.2	63.70 00	49.5 2.9	47.14 0.11	36.9 3.1
May 10.5	68.42 0.28	38.1 3.4	52.59 05	57.2 2.6	5.92 02	40.6 0.0	63.70 05	52.4 2.7	47.03 0.26	40.0 2.9
20.4	68.14 0.56	41.5 3.1	52.54 08	59.8 2.4	5.94 00	40.6 0.1	63.65 09	55.1 2.5	46.77 0.39	42.9 2.6
30.4	67.58 0.81	44.6 2.8	52.46 11	62.2 2.2	5.94 03	40.5 0.2	63.56 14	57.6 2.3	46.38 0.51	45.5 2.3
June 9.4	66.77 1.04	47.4 2.5	52.35 15	64.4 1.8	5.91 05	40.3 0.3	63.42 17	59.9 2.0	45.87 0.61	47.8 1.9
19.4	65.73 1.26	49.9 2.0	52.20 18	66.2 1.4	5.86 08	40.0 0.3	63.25 21	61.9 1.5	45.26 0.70	49.7 1.5
29.3	64.47 1.42	51.9 1.5	52.02 20	67.6 1.1	5.78 09	39.7 0.4	63.04 24	63.4 1.1	44.56 0.77	51.2 0.9
July 9.3	63.05 1.57	53.4 1.0	51.82 21	68.7 0.6	5.69 11	39.3 0.5	62.80 25	64.5 0.7	43.79 0.81	52.1 0.4
19.3	61.48 1.65	54.4 0.5	51.61 23	69.3 0.2	5.58 13	38.8 0.5	62.55 27	65.2 0.1	42.98 0.84	52.5 0.1
29.3	59.83 1.69	54.9 0.0	51.38 23	69.5 0.2	5.45 13	38.3 0.5	62.28 28	65.3 0.3	42.14 0.84	52.4 0.7
Aug. 8.2	58.14 1.66	54.9 0.7	51.15 24	69.3 0.8	5.32 14	37.8 0.5	62.00 28	65.0 0.8	41.30 0.83	51.7 1.2
18.2	56.48 1.58	54.2 1.2	50.91 22	68.5 1.2	5.18 14	37.3 0.6	61.72 27	64.2 1.2	40.47 0.80	50.5 1.7
28.2	54.90 1.45	53.0 1.7	50.69 20	67.3 1.6	5.04 12	36.7 0.5	61.45 25	63.0 1.7	39.67 0.75	48.8 2.2
Sept. 7.1	53.45 1.24	51.3 2.1	50.49 18	65.7 2.0	4.92 11	36.2 0.4	61.20 22	61.3 2.2	38.92 0.67	46.6 2.6
17.1	52.21 0.99	49.2 2.5	50.31 15	63.7 2.4	4.81 08	35.8 0.3	60.98 18	59.1 2.5	38.25 0.58	44.0 3.0
27.1	51.22 0.69	46.7 2.8	50.16 10	61.3 2.7	4.73 04	35.5 0.2	60.80 14	56.6 2.9	37.67 0.47	41.0 3.3
Oct. 7.1	50.53 0.36	43.9 3.0	50.06 05	58.6 3.1	4.69 01	35.3 0.0	60.66 08	53.7 3.2	37.20 0.34	37.7 3.5
17.0	50.17 0.01	40.9 3.0	50.01 00	55.5 3.3	4.68 04	35.3 0.2	60.58 02	50.5 3.4	36.86 0.20	34.2 3.8
27.0	50.18 0.37	37.9 2.9	50.01 07	52.2 3.4	4.72 09	35.5 0.4	60.56 04	47.1 3.6	36.66 0.05	30.4 3.9
Nov. 6.0	50.55 0.73	35.0 2.8	50.08 13	48.8 3.5	4.81 14	35.9 0.7	60.60 12	43.5 3.7	36.61 0.12	26.5 3.9
16.0	51.28 1.07	32.2 2.5	50.21 19	45.3 3.6	4.95 19	36.6 1.0	60.72 18	39.8 3.7	36.73 0.28	22.6 3.8
25.9	52.35 1.38	29.7 2.1	50.40 25	41.7 3.5	5.14 24	37.6 1.2	60.90 25	36.1 3.6	37.01 0.44	18.8 3.6
Dec. 5.9	53.73 1.64	27.6 1.6	50.65 30	38.2 3.3	5.38 27	38.8 1.4	61.15 32	32.5 3.5	37.45 0.60	15.2 3.4
15.9	55.37 1.84	26.0 1.0	50.95 35	34.9 3.0	5.65 30	40.2 1.6	61.47 37	29.0 3.1	38.05 0.73	11.8 3.0
25.8	57.21 1.99	25.0 0.5	51.30 39	31.9 2.6	5.95 32	41.8 1.7	61.84 40	25.9 2.7	38.78 0.84	8.8 2.5
35.8	59.20	24.5	51.69	29.3	6.27	43.5	62.24	23.2	39.62	6.3

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\rho$ Bootis.		$\alpha^3$ Centauri.		33 Bootis.		$\alpha$ Apodis.		$\epsilon$ Bootis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 14 27	° ' " +30 46	h m 14 33	° ' " -60 26	h m 14 35	° ' " +44 47	h m 14 36	° ' " -78 38	h m 14 40	° ' " +27 27
Jan. 0.8	47.70 s	43.1 "	14.43 s	44.2 "	20.76 s	74.4 "	12.12 s	37.0 "	53.86 s	56.0 "
10.8	48.04 -34	40.7 2.4	14.98 -55	44.4 0.2	21.14 -38	71.9 2.5	13.37 1.25	36.6 0.4	54.18 -32	53.5 2.5
20.8	48.38 -34	38.6 2.1	15.54 -56	45.1 0.7	21.53 -39	69.8 2.1	14.66 1.29	36.8 0.2	54.51 -33	51.4 2.1
30.8	48.73 -35	37.0 1.6	16.09 -55	46.2 1.1	21.93 -40	68.3 1.5	15.96 1.30	37.6 0.8	54.85 -34	49.7 1.7
Feb. 9-7	49.07 -34	35.9 1.1	16.63 -54	47.8 1.6	22.32 -39	67.4 0.9	17.24 1.28	38.9 1.3	55.19 -31	48.4 1.3
	49.07 -32	35.9 0.6	16.63 -51	47.8 1.9	22.32 -37	67.4 0.3	17.24 1.22	38.9 1.8	55.19 -31	48.4 0.7
19-7	49.39 -30	35.3 0.0	17.14 -48	49.7 2.2	22.69 -35	67.1 0.4	18.46 1.14	40.7 2.2	55.50 -30	47.7 0.3
Mar. 1-7	49.69 -26	35.3 0.5	17.62 -43	51.9 2.5	23.04 -31	67.5 0.9	19.60 1.04	42.9 2.6	55.80 -27	47.4 0.3
11.6	49.95 -23	35.8 0.9	18.05 -38	54.4 2.6	23.35 -27	68.4 1.4	20.64 0.91	45.5 2.9	56.07 -23	47.7 0.8
21.6	50.18 -19	36.7 1.3	18.43 -32	57.0 2.8	23.62 -23	69.8 1.8	21.55 0.78	48.4 3.1	56.30 -20	48.5 1.1
31.6	50.37 -15	38.0 1.7	18.75 -26	59.8 2.8	23.85 -17	71.6 2.2	22.33 0.64	51.5 3.3	56.50 -16	49.6 1.5
Apr. 10.6	50.52 -11	39.7 1.9	19.01 -21	62.6 2.9	24.02 -13	73.8 2.5	22.97 0.48	54.8 3.4	56.66 -13	51.1 1.8
20.5	50.63 -08	41.6 2.1	19.22 -14	65.5 2.8	24.15 -08	76.3 2.6	23.45 0.32	58.2 3.4	56.79 -09	52.9 1.9
30.5	50.71 -04	43.7 2.2	19.36 -08	68.3 2.7	24.23 -04	78.9 2.7	23.77 0.16	61.6 3.4	56.88 -05	54.8 2.1
May 10.5	50.75 -02	45.9 2.2	19.44 -03	71.0 2.5	24.27 -01	81.6 2.6	23.93 0.01	65.0 3.2	56.93 -02	56.9 2.1
20.5	50.75 -02	48.1 2.1	19.47 -04	73.5 2.4	24.26 -05	84.2 2.5	23.92 0.18	68.2 3.1	56.95 -01	59.0 2.0
30.4	50.73 -06	50.2 1.9	19.43 -10	75.9 2.1	24.21 -09	86.7 2.3	23.74 0.34	71.3 2.8	56.94 -04	61.0 1.9
June 9-4	50.67 -08	52.1 1.7	19.33 -16	78.0 1.8	24.12 -13	89.0 2.0	23.40 0.48	74.1 2.5	56.90 -06	62.9 1.7
19-4	50.59 -11	53.8 1.5	19.17 -21	79.8 1.5	23.99 -15	91.0 1.7	22.92 0.63	76.6 2.2	56.84 -10	64.6 1.5
29-3	50.48 -13	55.3 1.1	18.96 -25	81.3 1.1	23.84 -19	92.7 1.3	22.29 0.75	78.8 1.7	56.74 -12	66.1 1.2
July 9-3	50.35 -15	56.4 0.8	18.71 -30	82.4 0.7	23.65 -20	94.0 0.8	21.54 0.84	80.5 1.2	56.62 -13	67.3 0.9
19-3	50.20 -16	57.2 0.5	18.41 -34	83.1 0.3	23.45 -22	94.8 0.4	20.70 0.92	81.7 0.7	56.49 -15	68.2 0.6
29-3	50.04 -17	57.7 0.2	18.07 -35	83.4 0.2	23.23 -23	95.2 0.0	19.78 0.97	82.4 0.2	56.34 -17	68.8 0.3
Aug. 8-2	49.87 -18	57.9 0.3	17.72 -36	83.2 0.6	23.00 -23	95.2 0.4	18.81 0.98	82.6 0.4	56.17 -17	69.1 0.1
18.2	49.69 -18	57.6 0.6	17.36 -35	82.6 1.0	22.77 -23	94.8 0.9	17.83 0.96	82.2 0.9	56.00 -17	69.0 0.4
28.2	49.51 -16	57.0 1.0	17.01 -33	81.6 1.4	22.54 -22	93.9 1.4	16.87 0.89	81.3 1.4	55.83 -17	68.6 0.8
Sept. 7-2	49.35 -14	56.0 1.3	16.68 -29	80.2 1.8	22.32 -19	92.5 1.8	15.98 0.79	79.9 1.9	55.66 -15	67.8 1.2
17.1	49.21 -12	54.7 1.7	16.39 -24	78.4 2.0	22.13 -17	90.7 2.2	15.19 0.66	78.0 2.3	55.51 -12	66.6 1.5
27.1	49.09 -09	53.0 2.0	16.15 -18	76.4 2.2	21.96 -13	88.5 2.6	14.53 0.49	75.7 2.6	55.39 -09	65.1 1.8
Oct. 7-1	49.00 -04	51.0 2.4	15.97 -09	74.2 2.4	21.83 -08	86.0 2.9	14.04 0.30	73.1 2.8	55.30 -06	63.3 2.2
17.0	48.96 -00	48.6 2.6	15.88 -01	71.8 2.3	21.75 -03	83.1 3.2	13.74 0.08	70.3 2.9	55.24 -00	61.1 2.4
27.0	48.96 -06	46.0 2.9	15.87 -09	69.5 2.3	21.72 -03	79.9 3.3	13.66 0.14	67.4 2.9	55.24 -04	58.7 2.7
Nov. 6.0	49.02 -11	43.1 3.0	15.96 -18	67.2 2.1	21.75 -10	76.6 3.5	13.80 0.36	64.5 2.7	55.28 -09	56.0 2.8
16.0	49.13 -16	40.1 3.1	16.14 -27	65.1 1.8	21.85 -16	73.1 3.6	14.16 0.58	61.8 2.5	55.37 -15	53.2 3.0
25.9	49.29 -21	37.0 3.1	16.41 -36	63.3 1.4	22.01 -21	69.5 3.5	14.74 0.78	59.3 2.2	55.52 -20	50.2 3.1
Dec. 5-9	49.50 -26	33.9 3.1	16.77 -43	61.9 1.0	22.22 -28	66.0 3.4	15.52 0.95	57.1 1.7	55.72 -24	47.1 3.0
15.9	49.76 -30	30.8 2.9	17.20 -49	60.9 0.5	22.50 -32	62.6 3.2	16.47 1.10	55.4 1.2	55.96 -28	44.1 2.9
25.9	50.06 -33	27.9 2.7	17.69 -53	60.4 0.1	22.82 -36	59.4 2.8	17.57 1.20	54.2 0.7	56.24 -31	41.2 2.7
35.8	50.39	25.2	18.22	60.3	23.18	56.6	18.77	53.5	56.55	38.5

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Libræ.		$\beta$ Ursæ Minoris.		$\beta$ Bootis.		$\gamma$ Scorpii.		$\delta$ Bootis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m	° '	h m	° '	h m	° '	h m	° '	h m	° '
	14 45	-15 39	14 50	+74 31	14 58	+40 45	14 58	-24 54	15 11	+33 39
	s	"	s	"	s	"	s	"	s	"
Jan. 0.8	42.27	9.1	54.38	59.2	24.68	21.5	35.74	46.6	43.35	38.9
10.8	42.59	10.7	55.15	56.8	25.02	18.8	36.07	47.8	43.66	36.2
20.8	42.91	12.3	56.00	55.0	25.39	16.5	36.41	49.2	44.00	33.9
30.8	43.24	14.0	56.89	53.8	25.76	14.8	36.76	50.7	44.35	32.0
Feb. 9.7	43.56	15.6	57.79	53.2	26.13	13.6	37.10	52.2	44.69	30.6
	43.87	17.2	58.67	53.4	26.49	13.0	37.42	53.8	45.03	29.8
Mar. 1.7	44.15	18.6	59.51	54.2	26.84	13.0	37.73	55.4	45.35	29.5
11.7	44.41	19.9	60.27	55.6	27.15	13.6	38.01	56.9	45.65	29.8
21.6	44.64	21.0	60.93	57.6	27.42	14.7	38.26	58.3	45.92	30.6
31.6	44.84	21.9	61.47	60.0	27.66	16.3	38.48	59.6	46.15	31.9
Apr. 10.6	45.01	22.7	61.88	62.8	27.86	18.3	38.68	60.8	46.35	33.5
20.5	45.16	23.3	62.15	65.8	28.01	20.6	38.84	61.8	46.51	35.5
30.5	45.27	23.7	62.27	69.0	28.12	23.1	38.98	62.7	46.64	37.7
May 10.5	45.35	24.0	62.26	72.1	28.18	25.7	39.08	63.5	46.72	40.1
20.5	45.40	24.1	62.11	75.1	28.21	28.3	39.15	64.2	46.77	42.5
30.4	45.43	24.2	61.83	78.0	28.19	30.8	39.19	64.8	46.78	44.8
June 9.4	45.43	24.1	61.44	80.5	28.14	33.1	39.20	65.2	46.76	47.1
19.4	45.40	24.0	60.94	82.7	28.05	35.2	39.18	65.6	46.70	49.2
29.4	45.34	23.8	60.35	84.4	27.92	37.1	39.13	65.8	46.61	51.0
July 9.3	45.26	23.5	59.69	85.6	27.77	38.6	39.04	65.9	46.49	52.5
19.3	45.16	23.2	58.98	86.4	27.59	39.7	38.93	65.8	46.34	53.7
29.3	45.03	22.8	58.23	86.6	27.39	40.4	38.80	65.6	46.17	54.5
Aug. 8.2	44.89	22.4	57.46	86.3	27.18	40.7	38.65	65.3	45.99	55.0
18.2	44.75	21.9	56.69	85.5	26.96	40.5	38.49	64.9	45.79	55.1
28.2	44.60	21.4	55.93	84.1	26.74	39.8	38.33	64.3	45.59	54.7
Sept. 7.2	44.45	20.9	55.21	82.3	26.52	38.8	38.17	63.6	45.39	54.0
17.1	44.32	20.5	54.55	80.0	26.32	37.4	38.02	62.9	45.21	52.8
27.1	44.22	20.1	53.95	77.2	26.14	35.5	37.90	62.2	45.04	51.3
Oct. 7.1	44.14	19.8	53.45	74.1	26.00	33.2	37.81	61.5	44.91	49.4
17.1	44.11	19.6	53.06	70.7	25.90	30.6	37.76	60.8	44.81	47.1
27.0	44.12	19.7	52.80	67.1	25.85	27.7	37.75	60.3	44.75	44.5
Nov. 6.0	44.18	19.9	52.67	63.3	25.85	24.6	37.80	59.9	44.75	41.7
16.0	44.29	20.3	52.69	59.4	25.92	21.2	37.91	59.8	44.81	38.6
25.9	44.45	21.0	52.86	55.5	26.04	17.8	38.07	59.9	44.92	35.4
Dec. 5.9	44.66	21.9	53.18	51.7	26.22	14.3	38.28	60.2	45.08	32.1
15.9	44.91	23.1	53.65	48.2	26.46	10.9	38.53	60.8	45.30	28.9
25.9	45.20	24.5	54.25	45.0	26.75	7.7	38.82	61.7	45.56	25.7
35.8	45.51	26.0	54.96	42.2	27.08	4.7	39.14	62.8	45.86	22.8

# FIXED STARS, 1907.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Libræ.		$\gamma^2$ Ursæ Minoris.		$\mu^1$ Bootis.		$\rho$ Octantis.		$\beta$ Coronæ Borealis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 15 11	° ' " - 9 2	h m 15 20	° ' " +72 9	h m 15 20	° ' " +37 41	h m 15 21	° ' " -84 8	h m 15 23	° ' " +29 25
Jan. 0.9	58.32	15.5	48.61	46.4	56.68	68.1	33.52	61.2	57.81	32.5
10.8	58.62	17.2	49.24	43.7	57.00	65.3	35.71	60.0	58.11	29.8
20.8	58.93	18.9	49.94	41.4	57.34	62.9	38.07	59.4	58.43	27.5
30.8	59.25	20.5	50.70	39.8	57.69	61.0	40.53	59.4	58.77	25.5
Feb. 9.8	59.57	22.0	51.48	38.9	58.05	59.6	43.02	59.9	59.10	24.0
19.7	59.87	23.4	52.26	38.6	58.40	58.7	45.48	60.9	59.43	23.0
Mar. 1.7	60.16	24.6	53.02	39.0	58.74	58.5	47.86	62.4	59.74	22.5
11.7	60.43	25.6	53.73	40.0	59.05	58.8	50.11	64.4	60.04	22.6
21.6	60.67	26.4	54.37	41.6	59.34	59.7	52.18	66.7	60.30	23.2
31.6	60.89	26.9	54.92	43.8	59.59	61.0	54.03	69.4	60.54	24.3
Apr. 10.6	61.08	27.2	55.36	46.4	59.80	62.8	55.63	72.4	60.74	25.8
20.6	61.24	27.4	55.68	49.2	59.98	65.0	56.95	75.6	60.91	27.6
30.5	61.37	27.3	55.89	52.3	60.11	67.4	57.97	78.9	61.05	29.6
May 10.5	61.48	27.2	55.97	55.5	60.21	69.9	58.67	82.3	61.15	31.8
20.5	61.56	26.9	55.94	58.6	60.26	72.4	59.03	85.7	61.21	34.1
30.5	61.60	26.5	55.79	61.6	60.27	75.0	59.06	89.0	61.24	36.4
June 9.4	61.62	26.1	55.53	64.4	60.25	77.4	58.75	92.1	61.23	38.6
19.4	61.61	25.7	55.17	66.9	60.19	79.6	58.10	95.1	61.19	40.6
29.4	61.57	25.2	54.72	69.0	60.09	81.6	57.14	97.8	61.12	42.4
July 9.3	61.51	24.8	54.19	70.6	59.96	83.2	55.90	100.1	61.02	44.0
19.3	61.42	24.3	53.61	71.8	59.80	84.5	54.40	102.0	60.89	45.2
29.3	61.30	23.9	52.97	72.5	59.62	85.5	52.69	103.3	60.74	46.2
Aug. 8.3	61.17	23.5	52.30	72.7	59.42	86.0	50.84	104.2	60.56	46.8
18.2	61.02	23.1	51.62	72.3	59.21	86.1	48.89	104.5	60.38	47.0
28.2	60.87	22.7	50.93	71.4	58.99	85.8	46.92	104.2	60.18	46.8
Sept. 7.2	60.72	22.5	50.26	70.0	58.77	85.0	45.00	103.4	59.99	46.3
17.2	60.58	22.3	49.62	68.1	58.56	83.8	43.21	102.1	59.81	45.3
27.1	60.46	22.2	49.04	65.8	58.37	82.3	41.62	100.2	59.65	44.0
Oct. 7.1	60.37	22.2	48.53	63.0	58.22	80.3	40.30	97.9	59.51	42.3
17.1	60.31	22.4	48.10	59.8	58.10	77.9	39.31	95.3	59.41	40.3
27.0	60.29	22.8	47.78	56.4	58.03	75.2	38.70	92.4	59.34	38.0
Nov. 6.0	60.32	23.4	47.58	52.7	58.01	72.3	38.49	89.4	59.33	35.4
16.0	60.40	24.2	47.50	48.9	58.04	69.1	38.72	86.4	59.37	32.5
26.0	60.54	25.2	47.56	45.0	58.14	65.7	39.38	83.5	59.47	29.5
Dec. 5.9	60.72	26.5	47.75	41.1	58.29	62.3	40.45	80.8	59.62	26.4
15.9	60.94	27.9	48.08	37.4	58.50	59.0	41.91	78.4	59.82	23.2
25.9	61.20	29.4	48.54	34.0	58.76	55.7	43.69	76.5	60.07	20.2
35.9	61.49	31.1	49.10	30.9	59.05	52.7	45.75	75.0	60.35	17.3

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Coronæ Borealis.			$\alpha$ Serpentis.			$\epsilon$ Serpentis.			$\zeta$ Ursæ Minoris.			$\epsilon$ Coronæ Borealis.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
	15 30	+27 1		15 39	+6 42		15 46	+4 45		15 47	+78 4		15 53	+27 8	
Jan. 0.9	43.12	38.1		39.34	68.9		8.89	31.7		16.57	45.2		42.23	48.7	
10.9	43.41 .29	35.4 2.7		39.62 .28	66.7 2.2		9.16 .27	29.6 2.1		17.35 .78	42.3 2.9		42.50 .27	46.0 2.7	
20.8	43.73 .32	33.0 2.4		39.91 .29	64.7 2.0		9.45 .29	27.7 1.9		18.27 .92	39.9 2.4		42.80 .30	43.5 2.5	
30.8	44.05 .32	31.0 2.0		40.22 .31	62.9 1.8		9.75 .30	25.9 1.8		19.29 1.02	38.0 1.9		43.12 .32	41.4 2.1	
Feb. 9.8	44.38 .33	29.4 1.6		40.53 .31	61.3 1.6		10.06 .31	24.3 1.6		20.38 1.09	36.8 1.2		43.44 .32	39.7 1.7	
	44.38 .32	29.4 1.0		40.53 .30	61.3 1.3		10.06 .30	24.3 1.2		20.38 1.12	36.8 0.6		43.44 .33	39.7 1.2	
19.7	44.70 .31	28.4 0.6		40.83 .29	60.0 0.9		10.36 .30	23.1 1.0		21.50 1.12	36.2 0.1		43.77 .31	38.5 0.7	
Mar. 1.7	45.01 .30	27.8 0.0		41.12 .28	59.1 0.5		10.66 .28	22.1 0.6		22.62 1.06	36.3 0.8		44.08 .30	37.8 0.1	
11.7	45.31 .26	27.8 0.5		41.40 .25	58.6 0.2		10.94 .25	21.5 0.2		23.68 0.97	37.1 1.4		44.38 .28	37.7 0.4	
21.7	45.57 .24	28.3 1.0		41.65 .23	58.4 0.2		11.19 .24	21.3 0.1		24.65 0.86	38.5 1.9		44.66 .26	38.1 0.8	
31.6	45.81 .21	29.3 1.3		41.88 .21	58.6 0.5		11.43 .21	21.4 0.4		25.51 0.72	40.4 2.4		44.92 .22	38.9 1.3	
Apr. 10.6	46.02 .18	30.6 1.7		42.09 .18	59.1 0.7		11.64 .19	21.8 0.6		26.23 0.55	42.8 2.7		45.14 .20	40.2 1.7	
20.6	46.20 .14	32.3 1.9		42.27 .15	59.8 1.0		11.83 .16	22.4 0.9		26.78 0.38	45.5 3.0		45.34 .16	41.9 1.9	
30.6	46.34 .11	34.2 2.1		42.42 .13	60.8 1.1		11.99 .13	23.3 1.1		27.16 0.20	48.5 3.2		45.50 .13	43.8 2.1	
May 10.5	46.45 .07	36.3 2.2		42.55 .09	61.9 1.2		12.12 .10	24.4 1.1		27.36 0.01	51.7 3.1		45.63 .10	45.9 2.2	
20.5	46.52 .04	38.5 2.2		42.64 .07	63.1 1.3		12.22 .07	25.5 1.2		27.37 0.17	54.8 3.1		45.73 .06	48.1 2.3	
30.5	46.56 .01	40.7 2.1		42.71 .03	64.4 1.3		12.29 .04	26.7 1.2		27.20 0.34	57.9 2.9		45.79 .03	50.4 2.3	
June 9.4	46.57 .03	42.8 2.0		42.74 .00	65.7 1.2		12.33 .01	27.9 1.2		26.86 0.50	60.8 2.6		45.82 .01	52.7 2.1	
19.4	46.54 .07	44.8 1.8		42.74 .02	66.9 1.2		12.34 .02	29.1 1.1		26.36 0.65	63.4 2.3		45.81 .05	54.8 1.9	
29.4	46.47 .09	46.6 1.6		42.72 .06	68.1 1.1		12.32 .05	30.2 1.0		25.71 0.77	65.7 1.9		45.76 .08	56.7 1.7	
July 9.4	46.38 .12	48.2 1.3		42.66 .09	69.2 0.9		12.27 .08	31.2 0.9		24.94 0.88	67.6 1.5		45.68 .11	58.4 1.5	
19.3	46.26 .14	49.5 0.9		42.57 .11	70.1 0.7		12.19 .11	32.1 0.7		24.06 0.97	69.1 1.0		45.57 .14	59.9 1.1	
29.3	46.12 .17	50.4 0.6		42.46 .13	70.8 0.6		12.08 .13	32.8 0.6		23.09 1.03	70.1 0.4		45.43 .16	61.0 0.8	
Aug. 8.3	45.95 .18	51.0 0.3		42.33 .15	71.4 0.4		11.95 .14	33.4 0.4		22.06 1.07	70.5 0.0		45.27 .18	61.8 0.5	
18.3	45.77 .19	51.3 0.1		42.18 .15	71.8 0.2		11.81 .16	33.8 0.2		20.99 1.09	70.5 0.6		45.09 .19	62.3 0.1	
28.2	45.58 .18	51.2 0.4		42.03 .16	72.0 0.0		11.65 .16	34.0 0.0		19.90 1.08	69.9 1.1		44.90 .20	62.4 0.3	
Sept. 7.2	45.40 .18	50.8 0.8		41.87 .16	72.0 0.2		11.49 .16	34.0 0.1		18.82 1.03	68.8 1.6		44.70 .19	62.1 0.7	
17.2	45.22 .17	50.0 1.2		41.71 .14	71.8 0.5		11.33 .15	33.9 0.4		17.79 0.98	67.2 2.1		44.51 .18	61.4 1.0	
27.1	45.05 .14	48.8 1.6		41.57 .12	71.3 0.7		11.18 .12	33.5 0.6		16.81 0.89	65.1 2.5		44.33 .16	60.4 1.4	
Oct. 7.1	44.91 .10	47.2 1.9		41.45 .09	70.6 1.0		11.06 .09	32.9 0.9		15.92 0.77	62.6 2.9		44.17 .12	59.0 1.8	
17.1	44.81 .06	45.3 2.2		41.36 .05	69.6 1.2		10.97 .05	32.0 1.1		15.15 0.63	59.7 3.2		44.05 .09	57.2 2.1	
27.1	44.75 .01	43.1 2.5		41.31 .00	68.4 1.4		10.92 .01	30.9 1.3		14.52 0.47	56.5 3.5		43.96 .04	55.1 2.4	
Nov. 6.0	44.74 .03	40.6 2.7		41.31 .05	67.0 1.7		10.91 .04	29.6 1.6		14.05 0.30	53.0 3.7		43.92 .01	52.7 2.7	
16.0	44.77 .09	37.9 2.9		41.36 .09	65.3 1.9		10.95 .09	28.0 1.7		13.75 0.10	49.3 3.9		43.93 .07	50.0 2.8	
26.0	44.86 .15	35.0 3.0		41.45 .14	63.4 2.1		11.04 .14	26.3 1.9		13.65 0.10	45.4 3.8		44.00 .11	47.2 3.0	
Dec. 6.0	45.01 .19	32.0 3.1		41.59 .19	61.3 2.1		11.18 .18	24.4 2.1		13.75 0.31	41.6 3.7		44.11 .17	44.2 3.1	
15.9	45.20 .24	28.9 3.0		41.78 .23	59.2 2.3		11.36 .23	22.3 2.1		14.06 0.49	37.9 3.5		44.28 .22	41.1 3.0	
25.9	45.44 .27	25.9 2.9		42.01 .27	56.9 2.2		11.59 .26	20.2 2.1		14.55 0.68	34.4 3.2		44.50 .25	38.1 2.9	
35.9	45.71 .27	23.0 2.9		42.28 .27	54.7 2.2		11.85 .26	18.1 2.1		15.23 0.88	31.2 3.2		44.75 .28	35.2 2.9	

(CONSTANTS OF STRUVE AND PETERS.)

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### APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♌ Scorpii.		♍ Scorpii.		♊ Hercules.		Groombridge 2320.		♈ Apodis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 15 54	° ' -22 21	h m 15 59	° ' -19 32	h m 16 5	° ' +45 10	h m 16 6	° ' +68 3	h m 16 6	° ' -78 27
Jan. 0.9	47.88	15.5	59.58	54.1	48.14	40.1	0.59	13.6	18.31	25.6
10.9	48.18	16.4	59.87	55.1	48.43	37.0	1.03	10.4	19.37	24.0
20.8	48.50	17.5	60.18	56.2	48.76	34.3	1.55	7.6	20.54	22.9
30.8	48.83	18.6	60.50	57.4	49.12	32.0	2.13	5.4	21.80	22.3
Feb. 9.8	49.16	19.8	60.83	58.6	49.50	30.2	2.76	3.8	23.11	22.2
19.8	49.49	21.0	61.15	59.8	49.88	29.0	3.40	2.8	24.43	22.6
Mar. 1.7	49.81	22.1	61.46	60.9	50.25	28.5	4.05	2.6	25.74	23.4
11.7	50.11	23.2	61.76	61.9	50.62	28.6	4.67	3.0	27.02	24.7
21.7	50.40	24.2	62.05	62.8	50.96	29.3	5.25	4.1	28.23	26.4
31.6	50.66	25.1	62.31	63.5	51.27	30.6	5.78	5.7	29.35	28.5
Apr. 10.6	50.90	25.9	62.55	64.2	51.54	32.4	6.24	7.9	30.37	30.9
20.6	51.12	26.6	62.77	64.7	51.78	34.6	6.62	10.5	31.26	33.6
30.6	51.31	27.1	62.96	65.1	51.97	37.1	6.90	13.4	32.02	36.4
May 10.5	51.47	27.6	63.12	65.4	52.12	39.8	7.09	16.5	32.63	39.4
20.5	51.60	28.0	63.25	65.6	52.22	42.7	7.19	19.7	33.08	42.5
30.5	51.69	28.4	63.35	65.8	52.27	45.6	7.19	22.9	33.36	45.6
June 9.5	51.76	28.7	63.42	65.9	52.28	48.4	7.09	25.9	33.46	48.7
19.4	51.79	28.9	63.45	66.0	52.24	51.1	6.90	28.8	33.39	51.6
29.4	51.78	29.1	63.45	66.0	52.16	53.5	6.62	31.4	33.14	54.4
July 9.4	51.74	29.2	63.42	66.0	52.03	55.6	6.27	33.6	32.72	56.9
19.3	51.66	29.2	63.35	65.9	51.86	57.4	5.85	35.4	32.14	59.0
29.3	51.55	29.2	63.25	65.8	51.66	58.8	5.37	36.7	31.43	60.8
Aug. 8.3	51.42	29.1	63.12	65.7	51.43	59.8	4.85	37.6	30.61	62.1
18.3	51.27	28.9	62.97	65.5	51.17	60.3	4.29	37.9	29.70	62.9
28.2	51.10	28.6	62.80	65.2	50.90	60.3	3.71	37.7	28.73	63.2
Sept. 7.2	50.93	28.2	62.63	64.9	50.63	59.9	3.13	37.0	27.75	62.9
17.2	50.76	27.8	62.46	64.6	50.36	59.0	2.56	35.8	26.80	62.1
27.2	50.60	27.4	62.31	64.3	50.10	57.7	2.02	34.1	25.91	60.8
Oct. 7.1	50.47	27.0	62.17	64.0	49.87	55.9	1.52	31.9	25.12	59.0
17.1	50.37	26.6	62.07	63.7	49.68	53.6	1.09	29.3	24.48	56.8
27.1	50.32	26.2	62.01	63.5	49.53	51.0	0.73	26.3	24.02	54.3
Nov. 6.0	50.31	26.0	62.00	63.4	49.43	48.0	0.45	22.9	23.75	51.6
16.0	50.35	25.9	62.04	63.5	49.39	44.8	0.28	19.3	23.70	48.7
26.0	50.45	26.0	62.13	63.7	49.41	41.4	0.22	15.5	23.88	

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Ophiuchi.		$\sigma$ Coronæ Borealis.		$\tau$ Herculis.		$\gamma$ Apodis.		$\eta$ Ursæ Minoris.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 16 9	° ' " - 3 27	h m 16 11	° ' " +34 5	h m 16 16	° ' " +46 31	h m 16 19	° ' " -78 40	h m 16 20	° ' " +75 57
Jan. 0.9	26.29 s	12.1 s	9.66 s	38.2 s	54.43 s	62.2 s	2.23 s	63.3 s	7.90 s	67.7 s
10.9	26.55 .26	13.8 1.7	9.92 .26	35.2 3.0	54.71 .28	59.0 3.2	3.26 1.03	61.6 1.7	8.47 .57	64.5 3.2
20.9	26.83 .28	15.5 1.7	10.22 .30	32.6 2.6	55.04 .33	56.1 2.9	4.43 1.17	60.3 1.3	9.17 .70	61.7 2.8
30.8	27.13 .30	17.1 1.6	10.54 .32	30.3 2.3	55.39 .35	53.7 2.4	5.70 1.27	59.5 0.8	9.98 .81	59.4 2.3
Feb. 9.8	27.43 .30	18.5 1.4	10.87 .33	28.5 1.8	55.77 .38	51.9 1.8	7.02 1.32	59.2 0.3	10.88 .90	57.7 1.7
		1.2	1.2	1.3	1.3	1.3	1.35	0.2	.94	1.0
19.8	27.73 .30	19.7 1.0	11.21 .33	27.2 0.7	56.16 .38	50.6 0.6	8.37 1.35	59.4 0.6	11.82 .96	56.7 0.3
Mar. 1.7	28.03 .29	20.7 0.8	11.54 .32	26.5 0.1	56.54 .37	50.0 0.0	9.72 1.32	60.0 1.1	12.78 .94	56.4 0.3
11.7	28.32 .27	21.5 0.4	11.86 .31	26.4 0.4	56.91 .36	50.0 0.7	11.04 1.26	61.1 1.5	13.72 .88	56.7 0.9
21.7	28.59 .25	21.9 0.2	12.17 .28	26.8 1.0	57.27 .32	50.7 1.2	12.30 1.18	62.6 1.9	14.60 .81	57.6 1.6
31.7	28.84 .23	22.1 0.1	12.45 .25	27.8 1.4	57.59 .29	51.9 1.7	13.48 1.08	64.5 2.3	15.41 .71	59.2 2.1
Apr. 10.6	29.07 .21	22.0 0.3	12.70 .22	29.2 1.9	57.88 .25	53.6 2.2	14.56 0.96	66.8 2.5	16.12 .58	61.3 2.5
20.6	29.28 .18	21.7 0.5	12.92 .18	31.1 2.1	58.13 .21	55.8 2.5	15.52 0.83	69.3 2.7	16.70 .44	63.8 2.8
30.6	29.46 .16	21.2 0.5	13.10 .15	33.2 2.4	58.34 .17	58.3 2.7	16.35 0.83	72.0 3.0	17.14 .30	66.6 3.1
May 10.5	29.62 .12	20.6 0.7	13.25 .11	35.6 2.5	58.51 .11	61.0 2.9	17.03 0.52	75.0 3.0	17.44 .14	69.7 3.2
20.5	29.74 .10	19.9 0.8	13.36 .07	38.1 2.6	58.62 .07	63.9 3.0	17.55 0.35	78.0 3.1	17.58 .01	72.9 3.2
30.5	29.84 .07	19.1 0.8	13.43 .03	40.7 2.5	58.69 .01	66.9 2.9	17.90 0.16	81.1 3.0	17.57 .17	76.1 3.1
June 9.5	29.91 .04	18.3 0.8	13.46 .00	43.2 2.5	58.70 .03	69.8 2.7	18.06 0.01	84.1 3.0	17.40 .31	79.2 2.9
19.4	29.95 .00	17.5 0.8	13.46 .05	45.7 2.2	58.67 .08	72.5 2.5	18.05 0.20	87.1 2.8	17.09 .44	82.1 2.6
29.4	29.95 .03	16.7 0.7	13.41 .09	47.9 2.0	58.59 .12	75.0 2.3	17.85 0.38	89.9 2.6	16.65 .57	84.7 2.3
July 9.4	29.92 .07	16.0 0.7	13.32 .12	49.9 1.7	58.47 .17	77.3 1.9	17.47 0.54	92.5 2.3	16.08 .68	87.0 1.9
19.4	29.85 .09	15.3 0.6	13.20 .15	51.6 1.3	58.30 .20	79.2 1.5	16.93 0.69	94.8 1.9	15.40 .77	88.9 1.5
29.3	29.76 .12	14.7 0.5	13.05 .18	52.9 1.0	58.10 .24	80.7 1.1	16.24 0.82	96.7 1.4	14.63 .85	90.4 1.0
Aug. 8.3	29.64 .14	14.2 0.6	12.87 .20	53.9 0.6	57.86 .26	81.8 0.7	15.42 0.91	98.1 0.9	13.78 .90	91.4 0.4
18.3	29.50 .16	13.9 0.3	12.67 .21	54.5 0.2	57.60 .28	82.5 0.2	14.51 0.97	99.0 0.5	12.88 .93	91.8 0.0
28.3	29.34 .16	13.6 0.2	12.46 .23	54.7 0.2	57.32 .29	82.7 0.3	13.54 1.01	99.5 0.1	11.95 .95	91.8 0.5
Sept. 7.2	29.18 .16	13.4 0.0	12.23 .22	54.5 0.7	57.03 .28	82.4 0.8	12.53 0.99	99.4 0.7	11.00 .93	91.3 1.1
17.2	29.02 .16	13.4 0.1	12.01 .21	53.8 1.0	56.75 .27	81.6 1.3	11.54 0.93	98.7 1.1	10.07 .90	90.2 1.6
27.2	28.86 .13	13.5 0.3	11.80 .19	52.8 1.5	56.48 .25	80.3 1.7	10.61 0.83	97.6 1.6	9.17 .84	88.6 2.0
Oct. 7.1	28.73 .10	13.8 0.5	11.61 .16	51.3 1.9	56.23 .21	78.6 2.2	9.78 0.70	96.0 2.1	8.33 .75	86.6 2.5
17.1	28.63 .07	14.3 0.6	11.45 .12	49.4 2.2	56.02 .17	76.4 2.6	9.08 0.53	93.9 2.4	7.58 .65	84.1 2.9
27.1	28.56 .03	14.9 0.8	11.33 .07	47.2 2.6	55.85 .12	73.8 2.9	8.55 0.33	91.5 2.7	6.93 .52	81.2 3.3
Nov. 6.1	28.53 .02	15.7 1.1	11.26 .02	44.6 2.9	55.73 .06	70.9 3.2	8.22 0.11	88.8 2.8	6.41 .37	77.9 3.5
16.0	28.55 .08	16.8 1.2	11.24 .04	41.7 3.1	55.67 .01	67.7 3.4	8.11 0.12	86.0 2.9	6.04 .21	74.4 3.7
26.0	28.63 .12	18.0 1.4	11.28 .09	38.6 3.2	55.68 .07	64.3 3.6	8.23 0.34	83.1 2.8	5.83 .04	70.7 3.8
Dec. 6.0	28.75 .17	19.4 1.5	11.37 .14	35.4 3.3	55.75 .13	60.7 3.7	8.57 0.57	80.3 2.6	5.79 .13	66.9 3.8
15.9	28.92 .21	20.9 1.7	11.51 .20	32.1 3.3	55.88 .20	57.0 3.5	9.14 0.77	77.7 2.3	5.92 .31	63.1 3.7
25.9	29.13 .24	22.6 1.7	11.71 .25	28.8 3.1	56.08 .26	53.5 3.4	9.91 0.95	75.4 1.9	6.23 .47	59.4 3.4
35.9	29.37 .24	24.3 1.7	11.96 .25	25.7 3.1	56.34 .26	50.1 3.4	10.86 0.95	73.5 1.9	6.70 .47	56.0 3.4



# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Draconis.		$\alpha$ Scorpii. (Antares.)		$\beta$ Herculis.		$\Lambda$ Draconis.		$\zeta$ Ophiuchi.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 16 22	° +61 43	h m 16 23	° -26 13	h m 16 26	° +21 41	h m 16 28	° +68 57	h m 16 32	° -10 22
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 0.9	40.91	25.2	39.96	22.8	11.24	32.3	6.08	66.4	0.11	37.2
10.9	41.25	21.9	40.25	23.4	11.49	29.7	6.48	63.0	0.36	38.5
20.9	41.66	19.0	40.56	24.1	11.76	27.2	6.97	60.1	0.64	39.9
30.8	42.12	16.5	40.89	24.9	12.05	25.0	7.54	57.7	0.93	41.2
Feb. 9.8	42.62	14.6	41.22	25.8	12.35	23.2	8.16	55.8	1.23	42.4
19.8	43.14	13.4	41.56	26.7	12.66	21.9	8.82	54.6	1.54	43.5
Mar. 1.8	43.67	12.9	41.89	27.7	12.97	21.0	9.49	54.1	1.84	44.4
11.7	44.18	13.0	42.22	28.6	13.27	20.6	10.14	54.2	2.14	45.1
21.7	44.66	13.8	42.52	29.5	13.55	20.7	10.77	55.0	2.43	45.7
31.7	45.11	15.2	42.81	30.3	13.82	21.3	11.35	56.4	2.70	46.0
Apr. 10.6	45.51	17.2	43.08	31.0	14.07	22.3	11.86	58.4	2.95	46.1
20.6	45.85	19.6	43.33	31.7	14.29	23.6	12.29	60.8	3.18	46.1
30.6	46.12	22.3	43.55	32.3	14.48	25.3	12.63	63.6	3.39	45.9
May 10.6	46.32	25.3	43.75	32.9	14.64	27.2	12.88	66.6	3.57	45.6
20.5	46.45	28.5	43.91	33.5	14.77	29.3	13.03	69.8	3.72	45.1
30.5	46.50	31.7	44.04	34.0	14.87	31.4	13.07	73.0	3.85	44.7
June 9.5	46.47	34.8	44.14	34.4	14.93	33.5	13.02	76.2	3.94	44.2
19.5	46.38	37.8	44.20	34.9	14.96	35.6	12.87	79.2	4.00	43.7
29.4	46.21	40.5	44.22	35.3	14.95	37.5	12.62	82.0	4.02	43.2
July 9.4	45.98	42.9	44.20	35.6	14.90	39.3	12.28	84.4	4.01	42.8
19.4	45.69	44.9	44.14	35.9	14.82	40.8	11.87	86.5	3.96	42.4
29.3	45.34	46.5	44.04	36.0	14.71	42.0	11.39	88.1	3.88	42.0
Aug. 8.3	44.96	47.6	43.92	36.1	14.57	43.0	10.86	89.2	3.77	41.7
18.3	44.54	48.3	43.77	36.1	14.40	43.7	10.28	89.9	3.64	41.4
28.3	44.10	48.4	43.60	36.0	14.22	44.1	9.67	90.1	3.48	41.1
Sept. 7.2	43.64	48.0	43.41	35.8	14.03	44.1	9.05	89.7	3.31	41.0
17.2	43.19	47.1	43.23	35.5	13.84	43.7	8.43	88.8	3.14	40.9
27.2	42.76	45.7	43.05	35.1	13.65	43.0	7.83	87.4	2.98	40.8
Oct. 7.2	42.36	43.8	42.90	34.6	13.49	42.0	7.27	85.5	2.84	40.9
17.1	42.01	41.4	42.78	34.1	13.34	40.6	6.77	83.1	2.72	41.0
27.1	41.71	38.6	42.69	33.6	13.24	38.9	6.34	80.3	2.63	41.3
Nov. 6.1	41.48	35.5	42.65	33.2	13.17	36.9	6.00	77.1	2.59	41.7
16.0	41.34	32.0	42.67	32.9	13.16	34.6	5.76	73.6	2.59	42.3
26.0	41.28	28.3	42.74	32.7	13.19	32.1	5.63	69.9	2.65	43.1
Dec. 6.0	41.31	24.5	42.87	32.6	13.28	29.4	5.61	66.1	2.76	44.0
16.0	41.44	20.7	43.05	32.7	13.42	26.6	5.72	62.3	2.91	45.0
25.9	41.65	17.0	43.27	33.0	13.60	23.8	5.95	58.6	3.10	46.2
35.9	41.95	13.4	43.54	33.5	13.82	21.0	6.29	55.0	3.34	47.5

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Triang. Australis.		$\eta$ Herculis.		$\kappa$ Ophiuchi.		$\epsilon$ Ursæ Minoris.		$\delta$ Herculis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	<sup>h</sup> 16 38 <sup>m</sup> s	<sup>°</sup> -68 51 <sup>'</sup> "	<sup>h</sup> 16 39 <sup>m</sup> s	<sup>°</sup> +39 5 <sup>'</sup> "	<sup>h</sup> 16 53 <sup>m</sup> s	<sup>°</sup> + 9 31 <sup>'</sup> "	<sup>h</sup> 16 55 <sup>m</sup> s	<sup>°</sup> +82 11 <sup>'</sup> "	<sup>h</sup> 16 58 <sup>m</sup> s	<sup>°</sup> +33 41 <sup>'</sup> "
Jan. 0.9	43.84	11.8	40.22	55.2	13.87	13.0	20.12	27.0	8.12	69.8
10.9	44.41	10.2	40.46	52.0	14.09	10.8	20.82	23.7	8.34	66.7
20.9	45.06	9.0	40.74	49.1	14.34	8.7	21.78	20.7	8.60	63.9
30.8	45.77	8.1	41.06	46.6	14.61	6.8	22.99	18.1	8.89	61.4
Feb 9.8	46.51	7.7	41.39	44.6	14.90	5.2	24.40	16.1	9.20	59.3
19.8	47.27	7.8	41.74	43.1	15.20	3.9	25.94	14.7	9.52	57.7
Mar. 1.8	48.03	8.2	42.09	42.2	15.49	2.9	27.56	13.9	9.84	56.7
11.7	48.79	9.0	42.43	41.9	15.78	2.3	29.20	13.8	10.17	56.2
21.7	49.52	10.2	42.76	42.2	16.06	2.1	30.80	14.3	10.49	56.3
31.7	50.21	11.7	43.07	43.1	16.33	2.3	32.30	15.4	10.79	57.0
Apr. 10.7	50.86	13.5	43.35	44.5	16.59	2.9	33.65	17.1	11.07	58.2
20.6	51.45	15.6	43.60	46.4	16.82	3.8	34.81	19.3	11.33	59.8
30.6	51.97	17.9	43.82	48.6	17.03	5.0	35.74	21.9	11.56	61.8
May 10.6	52.42	20.4	44.00	51.1	17.22	6.3	36.42	24.8	11.76	64.1
20.5	52.79	23.0	44.15	53.8	17.38	7.9	36.83	27.8	11.92	66.6
30.5	53.07	25.6	44.25	56.6	17.51	9.5	36.96	31.0	12.04	69.3
June 9.5	53.26	28.3	44.31	59.4	17.61	11.1	36.80	34.1	12.12	72.0
19.5	53.34	30.9	44.32	62.1	17.67	12.7	36.37	37.1	12.16	74.6
29.5	53.32	33.4	44.29	64.6	17.70	14.2	35.68	39.9	12.16	77.1
July 9.4	53.21	35.7	44.21	66.9	17.69	15.6	34.74	42.5	12.12	79.4
19.4	52.99	37.8	44.09	68.9	17.64	16.9	33.59	44.7	12.03	81.4
29.4	52.69	39.6	43.94	70.6	17.56	18.0	32.25	46.5	11.91	83.2
Aug. 8.3	52.31	41.0	43.75	71.9	17.45	18.9	30.75	47.9	11.75	84.6
18.3	51.87	42.0	43.54	72.8	17.31	19.5	29.12	48.8	11.56	85.6
28.3	51.38	42.6	43.30	73.2	17.15	20.0	27.40	49.3	11.35	86.2
Sept. 7.2	50.86	42.7	43.05	73.3	16.98	20.2	25.64	49.2	11.12	86.5
17.2	50.34	42.3	42.80	72.8	16.80	20.1	23.86	48.6	10.89	86.3
27.2	49.84	41.4	42.56	71.9	16.62	19.8	22.11	47.6	10.66	85.6
Oct. 7.2	49.38	40.1	42.33	70.6	16.46	19.2	20.43	46.0	10.45	84.6
17.1	48.99	38.4	42.13	68.8	16.32	18.4	18.87	44.0	10.25	83.1
27.1	48.69	36.4	41.97	66.6	16.21	17.3	17.46	41.5	10.09	81.2
Nov. 6.1	48.50	34.1	41.85	64.1	16.14	15.9	16.25	38.7	9.97	79.0
16.1	48.42	31.7	41.79	61.2	16.11	14.3	15.28	35.5	9.90	76.4
26.0	48.48	29.2	41.78	58.0	16.13	12.5	14.57	32.1	9.88	73.5
Dec. 6.0	48.66	26.7	41.83	54.7	16.19	10.5	14.15	28.5	9.92	70.4
16.0	48.96	24.4	41.94	51.3	16.31	8.4	14.03	24.8	10.01	67.2
25.9	49.38	22.3	42.10	47.9	16.47	6.1	14.23	21.1	10.16	64.0
35.9	49.90	20.5	42.32	44.6	16.67	3.9	14.74	17.6	10.35	61.0

**FIXED STARS, 1907.**  
(CONSTANTS OF STRUVE AND PETERS.)

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**APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.**

Mean Solar Date.	γ Ophiuchi.		α <sup>1</sup> Hercules.		π Hercules.		θ Ophiuchi.		δ Ophiuchi.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m	° '	h m	° '	h m	° '	h m	° '	h m	° '
	17 5	-15 36	17 10	+14 29	17 11	+36 54	17 16	-24 54	17 20	-24 5
	s	"	s	"	s	"	s	"	s	"
Jan. 0.9	0.34	29.2	22.29	48.4	46.20	49.9	15.40	17.8	38.94	17.4
10.9	0.57	30.1	22.50	46.0	46.41	46.7	15.64	18.1	39.17	17.7
20.9	0.84	31.1	22.73	43.8	46.65	43.7	15.91	18.5	39.43	18.1
30.9	1.12	32.0	23.00	41.7	46.93	41.1	16.20	19.0	39.72	18.6
Feb. 9.8	1.42	32.9	23.28	40.0	47.24	38.9	16.51	19.5	40.03	19.2
	1.72	33.7	23.57	38.6	47.56	37.2	16.83	20.0	40.35	19.7
Mar. 1.8	2.03	34.4	23.86	37.5	47.90	36.1	17.16	20.6	40.67	20.2
11.8	2.34	35.0	24.15	36.9	48.24	35.5	17.49	21.1	41.00	20.7
21.7	2.64	35.5	24.44	36.8	48.57	35.6	17.81	21.5	41.32	21.1
31.7	2.93	35.8	24.72	37.1	48.88	36.2	18.12	21.9	41.63	21.5
Apr. 10.7	3.21	36.0	24.98	37.7	49.18	37.4	18.42	22.2	41.93	21.8
20.6	3.47	36.0	25.23	38.8	49.45	39.0	18.70	22.5	42.21	22.0
30.6	3.71	35.9	25.46	40.2	49.70	41.0	18.96	22.8	42.47	22.2
May 10.6	3.92	35.7	25.66	41.8	49.91	43.4	19.20	23.0	42.71	22.4
20.6	4.11	35.5	25.83	43.5	50.09	46.0	19.42	23.3	42.93	22.5
30.5	4.27	35.2	25.97	45.4	50.23	48.8	19.60	23.5	43.12	22.7
June 9.5	4.40	34.9	26.08	47.3	50.32	51.6	19.75	23.7	43.27	22.9
19.5	4.49	34.7	26.16	49.2	50.37	54.3	19.86	24.0	43.39	23.1
29.5	4.55	34.4	26.20	51.1	50.38	57.0	19.93	24.2	43.46	23.3
July 9.4	4.56	34.2	26.20	52.8	50.34	59.5	19.96	24.5	43.49	23.5
19.4	4.54	34.0	26.16	54.3	50.26	61.7	19.94	24.8	43.48	23.8
29.4	4.48	33.9	26.08	55.6	50.13	63.6	19.89	25.1	43.43	24.0
Aug. 8.3	4.39	33.7	25.97	56.7	49.97	65.2	19.80	25.3	43.34	24.2
18.3	4.26	33.6	25.83	57.5	49.77	66.4	19.67	25.5	43.21	24.4
28.3	4.11	33.5	25.67	58.1	49.55	67.2	19.51	25.6	43.06	24.5
Sept. 7.3	3.94	33.4	25.49	58.4	49.31	67.5	19.33	25.6	42.88	24.6
17.2	3.76	33.3	25.31	58.4	49.06	67.4	19.14	25.6	42.70	24.5
27.2	3.59	33.2	25.12	58.1	48.82	66.9	18.96	25.5	42.51	24.4
Oct. 7.2	3.43	33.2	24.94	57.5	48.58	65.9	18.78	25.3	42.33	24.3
17.2	3.29	33.2	24.79	56.5	48.37	64.5	18.62	25.0	42.17	24.1
27.1	3.18	33.3	24.66	55.3	48.19	62.7	18.50	24.8	42.05	23.9
Nov. 6.1	3.11	33.4	24.57	53.9	48.04	60.4	18.42	24.5	41.97	23.6
16.1	3.08	33.7	24.52	52.1	47.95	57.8	18.38	24.3	41.93	23.4
26.0	3.11	34.1	24.52	50.1	47.91	54.9	18.40	24.1	41.94	23.3
Dec. 6.0	3.18	34.6	24.57	47.9	47.92	51.8	18.47	24.0	42.01	23.3
16.0	3.31	35.2	24.66	45.5	47.99	48.5	18.60	24.0	42.13	23.3
26.0	3.48	35.9	24.80	43.1	48.12	45.2	18.77	24.1	42.29	23.5
35.9	3.70	36.8	24.99	40.6	48.30	41.9	18.98	24.4	42.50	23.8

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Aræ.		$\beta$ Draconis.		$\alpha$ Ophiuchi.		$\epsilon$ Herculis.		$\omega$ Draconis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 17 22	° ' " 36	h m 17 28	° ' " 21	h m 17 30	° ' " 37	h m 17 36	° ' " 46 3	h m 17 37	° ' " 47
Jan. 1.0	37.96	14.3	17.28	72.6	34.90	41.5	47.98	21.2	26.05	64.2
10.9	38.34	12.7	17.48	69.1	35.08	39.2	48.16	17.8	26.28	60.6
20.9	38.78	11.3	17.73	65.8	35.30	37.0	48.40	14.6	26.61	57.2
30.9	39.27	10.2	18.04	62.8	35.55	35.0	48.68	11.7	27.04	54.2
Feb. 9.8	39.80	9.4	18.40	60.3	35.82	33.3	48.99	9.2	27.55	51.6
19.8	40.36	9.0	18.78	58.4	36.10	31.9	49.33	7.2	28.12	49.6
Mar. 1.8	40.93	8.8	19.18	57.1	36.39	30.9	49.69	5.8	28.74	48.2
11.8	41.50	9.0	19.59	56.4	36.68	30.2	50.06	5.0	29.38	47.4
21.7	42.07	9.5	20.00	56.4	36.97	30.0	50.43	4.9	30.03	47.3
31.7	42.63	10.3	20.40	57.0	37.25	30.2	50.79	5.4	30.66	47.9
Apr. 10.7	43.16	11.4	20.78	58.2	37.52	30.8	51.14	6.5	31.26	49.2
20.7	43.66	12.7	21.12	60.0	37.78	31.8	51.46	8.1	31.80	51.0
30.6	44.12	14.3	21.43	62.3	38.02	33.1	51.75	10.2	32.28	53.3
May 10.6	44.54	16.1	21.69	64.9	38.24	34.6	52.00	12.7	32.68	56.0
20.6	44.91	18.0	21.91	67.8	38.43	36.3	52.21	15.5	32.99	59.0
30.5	45.22	20.0	22.07	70.9	38.59	38.1	52.38	18.5	33.20	62.2
June 9.5	45.46	22.2	22.18	74.1	38.72	40.0	52.50	21.6	33.31	65.5
19.5	45.63	24.4	22.22	77.2	38.82	41.8	52.57	24.6	33.32	68.8
29.5	45.72	26.6	22.20	80.3	38.88	43.6	52.58	27.6	33.22	72.0
July 9.4	45.74	28.7	22.13	83.2	38.89	45.3	52.54	30.5	33.03	75.0
19.4	45.67	30.7	22.00	85.8	38.87	46.8	52.45	33.1	32.74	77.8
29.4	45.53	32.5	21.81	88.1	38.81	48.2	52.31	35.3	32.37	80.2
Aug. 8.4	45.33	34.1	21.58	90.0	38.72	49.3	52.12	37.3	31.91	82.3
18.3	45.06	35.4	21.30	91.5	38.59	50.2	51.90	38.9	31.39	83.9
28.3	44.74	36.3	20.99	92.5	38.44	50.8	51.64	40.0	30.82	85.1
Sept. 7.3	44.39	36.8	20.65	93.1	38.27	51.2	51.36	40.6	30.20	85.8
17.2	44.01	37.0	20.30	93.2	38.08	51.3	51.06	40.8	29.56	86.0
27.2	43.64	36.7	19.95	92.7	37.89	51.1	50.75	40.5	28.92	85.6
Oct. 7.2	43.28	36.0	19.60	91.8	37.71	50.6	50.46	39.7	28.29	84.7
17.2	42.96	34.9	19.28	90.3	37.55	49.8	50.18	38.4	27.69	83.3
27.1	42.70	33.4	19.00	88.4	37.41	48.8	49.94	36.6	27.13	81.4
Nov. 6.1	42.50	31.7	18.76	86.0	37.31	47.4	49.73	34.4	26.64	79.0
16.1	42.39	29.8	18.58	83.2	37.25	45.8	49.57	31.8	26.24	76.2
26.1	42.37	27.7	18.46	80.0	37.23	44.0	49.47	28.8	25.94	73.0
Dec. 6.0	42.44	25.6	18.40	76.6	37.26	42.0	49.43	25.6	25.74	69.5
16.0	42.60	23.5	18.42	73.0	37.34	39.8	49.45	22.2	25.65	65.9
26.0	42.86	21.5	18.51	69.4	37.46	37.5	49.54	18.6	25.68	62.1
35.9	43.20	19.7	18.67	65.8	37.63	35.1	49.68	15.1	25.83	58.4

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\mu$ Herculis.		$\psi^*$ Draconis.		$\theta$ Herculis.		$\gamma$ Draconis.		$\gamma^*$ Sagittarii.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 17 42	° ' " +27 46	h m 17 43	° ' " +72 11	h m 17 53	° ' " +37 15	h m 17 54	° ' " +51 29	h m 17 59	° ' " -30 25
Jan. 1.0	46.93	31.3	31.30	41.8	1.54	47.1	24.24	60.2	47.33	26.7
10.9	47.10	28.4	31.52	38.2	1.70	43.9	24.40	56.7	47.53	26.4
20.9	47.31	25.6	31.87	34.8	1.91	40.8	24.62	53.4	47.77	26.2
30.9	47.55	23.0	32.34	31.7	2.15	38.0	24.89	50.3	48.05	26.1
Feb. 9.9	47.82	20.8	32.92	29.1	2.42	35.6	25.21	47.6	48.35	26.1
19.8	48.10	19.1	33.57	27.0	2.72	33.6	25.56	45.5	48.66	26.1
Mar. 1.8	48.40	17.8	34.28	25.5	3.04	32.1	25.94	43.9	48.99	26.2
11.8	48.71	17.0	35.02	24.7	3.37	31.2	26.34	42.9	49.33	26.2
21.7	49.02	16.8	35.78	24.5	3.70	31.0	26.74	42.6	49.67	26.3
31.7	49.32	17.1	36.52	25.0	4.03	31.3	27.14	43.0	50.01	26.4
Apr. 10.7	49.61	17.9	37.22	26.2	4.35	32.2	27.53	43.9	50.34	26.5
20.7	49.89	19.2	37.86	27.9	4.65	33.6	27.89	45.5	50.66	26.6
30.6	50.14	20.9	38.42	30.1	4.93	35.5	28.22	47.5	50.97	26.8
May 10.6	50.37	22.9	38.89	32.7	5.18	37.7	28.51	50.0	51.26	27.0
20.6	50.57	25.2	39.25	35.7	5.40	40.2	28.76	52.8	51.52	27.2
30.6	50.74	27.6	39.50	38.9	5.58	43.0	28.95	55.8	51.75	27.5
June 9.5	50.88	30.1	39.63	42.1	5.72	45.8	29.09	59.0	51.95	27.9
19.5	50.97	32.6	39.64	45.4	5.82	48.7	29.18	62.2	52.11	28.4
29.5	51.02	35.1	39.52	48.6	5.87	51.6	29.20	65.4	52.23	28.9
July 9.4	51.03	37.4	39.29	51.6	5.87	54.3	29.16	68.4	52.31	29.4
19.4	50.99	39.6	38.94	54.4	5.82	56.8	29.07	71.2	52.33	30.0
29.4	50.92	41.5	38.49	56.9	5.73	59.0	28.91	73.7	52.31	30.6
Aug. 8.4	50.80	43.1	37.95	59.0	5.59	60.9	28.71	75.9	52.24	31.2
18.3	50.65	44.4	37.32	60.7	5.42	62.5	28.46	77.7	52.13	31.7
28.3	50.47	45.3	36.63	61.9	5.21	63.7	28.17	79.1	51.99	32.2
Sept. 7.3	50.27	45.9	35.90	62.7	4.98	64.5	27.85	80.0	51.81	32.5
17.3	50.06	46.1	35.13	62.9	4.73	64.9	27.51	80.4	51.62	32.8
27.2	49.83	45.9	34.36	62.6	4.48	64.8	27.16	80.3	51.42	32.9
Oct. 7.2	49.62	45.3	33.59	61.8	4.23	64.2	26.82	79.7	51.22	32.8
17.2	49.42	44.3	32.86	60.5	3.99	63.2	26.49	78.6	51.04	32.7
27.1	49.24	42.9	32.18	58.6	3.78	61.8	26.19	77.0	50.88	32.4
Nov. 6.1	49.10	41.1	31.58	56.3	3.60	59.9	25.93	74.9	50.76	32.0
16.1	49.00	39.0	31.07	53.6	3.46	57.6	25.72	72.3	50.69	31.6
26.1	48.95	36.6	30.67	50.4	3.38	55.0	25.57	69.4	50.66	31.1
Dec. 6.0	48.95	33.9	30.39	47.0	3.34	52.1	25.48	66.2	50.69	30.7
16.0	48.99	31.1	30.25	43.4	3.36	49.0	25.46	62.8	50.77	30.3
26.0	49.09	28.1	30.24	39.7	3.44	45.7	25.51	59.2	50.90	29.9
36.0	49.24	25.1	30.38	36.0	3.57	42.4	25.63	55.6	51.08	29.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Herculis.		μ Sagittarii.		η Serpentis.		λ Sagittarii.		γ Draconis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 18 3	° ' " +28 44	h m 18 8	° ' " -21 4	h m 18 16	° ' " -2 55	h m 18 22	° ' " -25 28	h m 18 22	° ' " +72 41
Jan. 1.0	52.68	60.2	9.62	56.2	27.58	20.3	11.33	21.0	40.02	36.7
11.0	52.82	57.3	9.80	56.5	27.74	21.7	11.50	20.9	40.12	33.1
20.9	53.01	54.5	10.02	56.8	27.93	23.0	11.71	20.9	40.36	29.5
30.9	53.24	51.9	10.26	57.2	28.14	24.3	11.95	21.0	40.74	26.2
Feb. 9.9	53.49	49.6	10.53	57.5	28.38	25.4	12.22	21.0	41.23	23.2
19.8	53.77	47.8	10.82	57.8	28.64	26.3	12.51	21.0	41.82	20.7
Mar. 1.8	54.06	46.4	11.12	58.0	28.92	27.0	12.82	21.0	42.49	18.8
11.8	54.36	45.5	11.43	58.1	29.20	27.5	13.13	21.0	43.22	17.5
21.8	54.67	45.1	11.75	58.2	29.48	27.7	13.45	20.9	43.98	16.8
31.7	54.98	45.3	12.06	58.2	29.77	27.6	13.78	20.8	44.75	16.8
Apr. 10.7	55.28	46.1	12.37	58.1	30.06	27.2	14.10	20.6	45.50	17.4
20.7	55.57	47.3	12.67	57.9	30.34	26.6	14.42	20.4	46.21	18.7
30.7	55.84	48.9	12.96	57.7	30.60	25.8	14.72	20.3	46.86	20.5
May 10.6	56.09	50.9	13.23	57.4	30.86	24.8	15.01	20.1	47.43	22.8
20.6	56.31	53.2	13.48	57.1	31.09	23.7	15.28	20.0	47.90	25.6
30.6	56.50	55.7	13.70	56.9	31.30	22.5	15.53	19.9	48.27	28.6
June 9.5	56.65	58.3	13.90	56.7	31.48	21.3	15.74	19.9	48.52	31.8
19.5	56.77	60.9	14.06	56.6	31.62	20.1	15.92	19.9	48.64	35.1
29.5	56.84	63.5	14.18	56.5	31.73	19.0	16.05	20.1	48.63	38.4
July 9.5	56.87	66.0	14.25	56.5	31.80	18.0	16.15	20.3	48.50	41.7
19.4	56.85	68.3	14.29	56.6	31.83	17.1	16.19	20.6	48.25	44.8
29.4	56.79	70.4	14.28	56.7	31.82	16.3	16.19	21.0	47.88	47.6
Aug. 8.4	56.69	72.2	14.22	56.9	31.77	15.6	16.15	21.4	47.41	50.2
18.4	56.55	73.7	14.13	57.0	31.68	15.1	16.06	21.8	46.84	52.4
28.3	56.38	74.9	14.00	57.2	31.56	14.7	15.94	22.1	46.19	54.2
Sept. 7.3	56.18	75.7	13.84	57.4	31.41	14.5	15.78	22.5	45.47	55.5
17.3	55.96	76.1	13.66	57.6	31.24	14.4	15.60	22.8	44.70	56.3
27.2	55.74	76.1	13.48	57.7	31.07	14.5	15.41	23.0	43.91	56.7
Oct. 7.2	55.52	75.7	13.29	57.8	30.89	14.7	15.22	23.1	43.11	56.5
17.2	55.31	74.9	13.12	57.8	30.72	15.1	15.04	23.1	42.32	55.8
27.2	55.12	73.7	12.98	57.8	30.57	15.6	14.88	23.1	41.57	54.5
Nov. 6.1	54.96	72.1	12.86	57.8	30.45	16.2	14.75	23.0	40.88	52.7
16.1	54.84	70.1	12.78	57.8	30.37	17.0	14.66	22.8	40.27	50.5
26.1	54.77	67.8	12.75	57.9	30.33	18.0	14.62	22.7	39.75	47.8
Dec. 6.1	54.74	65.2	12.77	57.9	30.33	19.1	14.62	22.5	39.35	44.7
16.0	54.77	62.4	12.84	58.1	30.38	20.3	14.68	22.4	39.08	41.3
26.0	54.84	59.5	12.95	58.3	30.47	21.6	14.78	22.2	38.95	37.7
36.0	54.96	56.5	13.11	58.5	30.60	23.0	14.93	22.2	38.96	34.0

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♈ Aquilæ.		♉ Pavonis.		α Lyrae. (Vega.)		β Lyrae.		50 Draconis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 18 30	° ' " - 8 18	h m 18 32	° ' " - 71 30	h m 18 33	° ' " + 38 41	h m 18 46	° ' " + 33 15	h m 18 49	° ' " + 75 19
Jan. 1.0	6.48 s	30.9 "	3.81 s	26.3 "	45.12 s	51.6 "	36.58 s	19.1 "	18.24 s	32.8 "
11.0	6.62 .14	31.9 1.0	4.16 .35	23.7 2.6	45.22 .10	48.4 3.2	36.67 .09	16.1 3.0	18.24 .00	29.2 3.6
21.0	6.80 .18	32.9 1.0	4.62 .46	21.2 2.5	45.38 .16	45.3 3.1	36.81 .14	13.1 3.0	18.39 .15	25.7 3.5
30.9	7.01 .21	33.8 0.9	5.19 .57	19.0 2.2	45.58 .20	42.3 3.0	36.99 .18	10.3 2.8	18.71 .32	22.3 3.4
Feb. 9.9	7.25 .24	34.6 0.8	5.85 .66	17.0 2.0	45.82 .24	39.7 2.6	37.21 .22	7.8 2.5	19.18 .47	19.1 3.2
	7.25 .26	34.6 0.7	5.85 .73	17.0 1.7	45.82 .27	39.7 2.2	37.21 .25	7.8 2.1	19.18 .60	19.1 2.7
Mar. 19.9	7.51 .27	35.3 0.5	6.58 .79	15.3 1.3	46.09 .30	37.5 1.7	37.46 .28	5.7 1.7	19.78 .71	16.4 2.2
1.8	7.78 .28	35.8 0.3	7.37 .82	14.0 1.0	46.39 .32	35.8 1.2	37.74 .30	4.0 1.2	20.49 .80	14.2 1.6
11.8	8.06 .29	36.1 0.0	8.19 .85	13.0 0.6	46.71 .33	34.6 0.6	38.04 .30	2.8 0.6	21.29 .85	12.6 1.0
21.8	8.35 .30	36.1 0.1	9.04 .86	12.4 0.2	47.04 .33	34.0 0.0	38.34 .32	2.1 0.1	22.14 .88	11.6 0.4
31.8	8.65 .29	36.0 0.4	9.90 .86	12.2 0.1	47.37 .34	34.0 0.6	38.66 .32	2.0 0.5	23.02 .88	11.2 0.3
Apr. 10.7	8.94 .29	35.6 0.6	10.76 .83	12.3 0.6	47.71 .32	34.6 1.1	38.98 .31	2.5 1.1	23.90 .85	11.5 1.0
20.7	9.23 .28	35.0 0.7	11.59 .80	12.9 0.9	48.03 .31	35.7 1.7	39.29 .30	3.6 1.5	24.75 .80	12.5 1.5
30.7	9.51 .26	34.3 0.8	12.39 .75	13.8 1.3	48.34 .29	37.4 2.1	39.59 .29	5.1 1.9	25.55 .71	14.0 2.0
May 10.6	9.77 .25	33.5 0.9	13.14 .69	15.1 1.6	48.63 .26	39.5 2.4	39.88 .26	7.0 2.3	26.26 .61	16.0 2.5
20.6	10.02 .23	32.6 1.0	13.83 .61	16.7 1.9	48.89 .22	41.9 2.7	40.14 .23	9.3 2.6	26.87 .49	18.5 2.9
June 30.6	10.25 .20	31.6 1.0	14.44 .52	18.6 2.2	49.11 .19	44.6 2.9	40.37 .19	11.9 2.7	27.36 .35	21.4 3.1
9.6	10.45 .16	30.6 0.9	14.96 .41	20.8 2.3	49.30 .14	47.5 3.0	40.56 .16	14.6 2.8	27.71 .21	24.5 3.4
19.5	10.61 .13	29.7 0.9	15.37 .30	23.1 2.5	49.44 .09	50.5 3.0	40.72 .11	17.4 2.9	27.92 .07	27.8 3.3
29.5	10.74 .09	28.8 0.8	15.67 .18	25.6 2.6	49.53 .05	53.5 2.9	40.83 .07	20.3 2.8	27.99 .08	31.2 3.3
July 9.5	10.83 .04	28.0 0.6	15.85 .06	28.2 2.6	49.58 .01	56.4 2.8	40.90 .02	23.1 2.6	27.91 .23	34.5 3.3
19.5	10.87 .01	27.4 0.6	15.91 .07	30.8 2.6	49.57 .06	59.2 2.6	40.92 .03	25.7 2.5	27.68 .37	37.8 3.0
29.4	10.88 .04	26.8 0.5	15.84 .20	33.4 2.4	49.51 .10	61.8 2.3	40.89 .08	28.2 2.3	27.31 .50	40.8 2.9
Aug. 8.4	10.84 .08	26.3 0.3	15.64 .31	35.8 2.1	49.41 .15	64.1 2.0	40.81 .12	30.5 1.9	26.81 .62	43.7 2.5
18.4	10.76 .12	26.0 0.2	15.33 .41	37.9 1.8	49.26 .19	66.1 1.6	40.69 .16	32.4 1.6	26.19 .73	46.2 2.1
28.4	10.64 .14	25.8 0.1	14.92 .49	39.7 1.5	49.07 .22	67.7 1.2	40.53 .19	34.0 1.2	25.46 .82	48.3 1.7
Sept. 7.3	10.50 .16	25.7 0.0	14.43 .56	41.2 1.1	48.85 .24	68.9 0.8	40.34 .22	35.2 0.9	24.64 .88	50.0 1.3
17.3	10.34 .17	25.7 0.1	13.87 .59	42.3 0.5	48.61 .26	69.7 0.4	40.12 .23	36.1 0.9	23.76 .93	51.3 1.8
27.3	10.17 .18	25.8 0.2	13.28 .61	42.8 0.1	48.35 .26	70.1 0.1	39.89 .24	36.5 0.4	22.83 .95	52.1 0.3
Oct. 7.2	9.99 .17	26.0 0.3	12.67 .59	42.9 0.5	48.09 .25	70.0 0.6	39.65 .23	36.5 0.4	21.88 .95	52.4 0.3
17.2	9.82 .15	26.3 0.4	12.08 .54	42.4 1.0	47.84 .24	69.4 1.0	39.42 .22	36.1 0.9	20.93 .92	52.1 0.8
27.2	9.67 .12	26.7 0.4	11.54 .47	41.4 1.4	47.60 .21	68.4 1.5	39.20 .20	35.2 1.3	20.01 .88	51.3 1.4
Nov. 6.2	9.55 .09	27.1 0.6	11.07 .38	40.0 1.8	47.39 .18	66.9 2.0	39.00 .16	33.9 1.7	19.13 .80	49.9 1.9
16.1	9.46 .05	27.7 0.7	10.69 .26	38.2 2.2	47.21 .13	64.9 2.3	38.84 .12	32.2 2.1	18.33 .69	48.0 2.3
26.1	9.41 .01	28.4 0.8	10.43 .13	36.0 2.4	47.08 .08	62.6 2.6	38.72 .08	30.1 2.4	17.64 .57	45.7 2.8
Dec. 6.1	9.40 .04	29.2 0.8	10.30 .00	33.6 2.6	47.00 .03	60.0 3.0	38.64 .03	27.7 2.8	17.07 .44	42.9 3.1
16.0	9.44 .08	30.0 1.0	10.30 .14	31.0 2.7	46.97 .02	57.0 3.1	38.61 .02	24.9 2.9	16.63 .28	39.8 3.4
26.0	9.52 .13	31.0 0.9	10.44 .28	28.3 2.6	46.99 .08	53.9 3.2	38.63 .07	22.0 3.0	16.35 .12	36.4 3.6
36.0	9.65	31.9	10.72	25.7	47.07	50.7	38.70	19.0	16.23	32.8

## FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\sigma$ Sagittarii.		$\gamma$ Lyrae.		$\zeta$ Aquilæ.		$\epsilon$ Lyrae.		$\sigma$ Octantis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 18 49	° -26 24	h m 18 55	° +32 33	h m 19 1	° +13 43	h m 19 3	° +35 56	h 19	° -89 14
Jan. 1.0	27.32	43.6	25.68	45.4	5.99	32.1	56.81	78.0	9 11.8	36.2
11.0	27.46	43.4	25.77	42.4	6.09	30.0	56.89	74.9	9 15.1	32.8
21.0	27.64	43.2	25.90	39.4	6.22	27.9	57.01	71.9	9 21.6	29.5
30.9	27.86	43.0	26.07	36.7	6.39	25.9	57.17	69.0	9 30.9	26.4
Feb. 9.9	28.11	42.8	26.28	34.2	6.59	24.1	57.37	66.4	9 42.7	23.5
19.9	28.38	42.6	26.52	32.0	6.81	22.6	57.61	64.1	9 56.8	21.0
Mar. 1.9	28.68	42.3	26.79	30.3	7.06	21.4	57.88	62.2	10 12.7	18.8
11.8	28.98	42.1	27.08	29.0	7.32	20.6	58.17	60.9	10 30.0	17.1
21.8	29.30	41.8	27.38	28.3	7.60	20.2	58.48	60.1	10 48.4	15.8
31.8	29.63	41.4	27.70	28.2	7.89	20.3	58.80	59.9	11 7.4	15.0
Apr. 10.7	29.95	41.0	28.02	28.7	8.17	20.7	59.13	60.2	11 26.6	14.6
20.7	30.28	40.6	28.33	29.6	8.46	21.6	59.45	61.1	11 45.6	14.7
30.7	30.60	40.3	28.63	31.1	8.75	22.8	59.77	62.6	12 4.0	15.3
May 10.7	30.90	39.9	28.92	33.0	9.02	24.3	60.07	64.4	12 21.5	16.4
20.6	31.19	39.6	29.19	35.2	9.28	26.1	60.35	66.7	12 37.7	17.9
30.6	31.46	39.4	29.43	37.7	9.51	28.1	60.60	69.3	12 52.2	19.8
June 9.6	31.70	39.3	29.63	40.4	9.72	30.2	60.81	72.1	13 4.7	22.1
19.6	31.91	39.3	29.80	43.3	9.90	32.3	60.98	75.0	13 15.0	24.7
29.5	32.07	39.4	29.92	46.1	10.04	34.4	61.11	77.9	13 22.8	27.6
July 9.5	32.19	39.6	29.99	48.9	10.13	36.5	61.19	80.9	13 27.8	30.6
19.5	32.27	39.9	30.02	51.6	10.19	38.4	61.23	83.7	13 29.9	33.7
29.4	32.29	40.3	30.00	54.1	10.20	40.1	61.21	86.4	13 29.1	36.8
Aug. 8.4	32.27	40.8	29.93	56.4	10.17	41.7	61.14	88.8	13 25.4	39.8
18.4	32.21	41.3	29.82	58.4	10.10	43.0	61.03	91.0	13 18.8	42.7
28.4	32.10	41.8	29.67	60.0	9.99	44.1	60.87	92.8	13 9.7	45.2
Sept. 7.3	31.96	42.3	29.49	61.3	9.85	45.0	60.68	94.2	12 58.2	47.3
17.3	31.79	42.7	29.28	62.2	9.69	45.5	60.46	95.3	12 44.9	49.0
27.3	31.60	43.0	29.05	62.7	9.51	45.8	60.23	95.9	12 30.1	50.1
Oct. 7.3	31.41	43.3	28.82	62.8	9.32	45.8	59.98	96.1	12 14.5	50.7
17.2	31.23	43.4	28.58	62.5	9.13	45.4	59.73	95.8	11 58.7	50.6
27.2	31.06	43.5	28.36	61.7	8.96	44.8	59.50	95.1	11 43.3	49.9
Nov. 6.2	30.91	43.5	28.17	60.5	8.81	43.9	59.29	94.0	11 28.9	48.6
16.1	30.80	43.3	28.00	58.8	8.68	42.7	59.11	92.4	11 16.2	46.7
26.1	30.73	43.2	27.87	56.8	8.59	41.3	58.96	90.4	11 5.6	44.4
Dec. 6.1	30.71	43.0	27.79	54.5	8.54	39.6	58.86	88.0	10 57.7	41.6
16.1	30.74	42.8	27.75	51.8	8.53	37.7	58.80	85.3	10 52.7	38.5
26.0	30.82	42.5	27.76	49.0	8.56	35.6	58.80	82.4	10 50.9	35.3
36.0	30.94	42.3	27.82	46.0	8.64	33.5	58.84	79.4	10 52.3	31.9



# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Sagittarii.		$\delta$ Draconis.		$\theta$ Lyrae.		$\tau$ Draconis.		$\delta$ Aquilæ.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 19 12	° ' " -19 7	h m 19 12	° ' " +67 29	h m 19 13	° ' " +37 57	h m 19 17	° ' " +73 10	h m 19 20	° ' " + 2 55
Jan. 1.0	9.20	6.8	28.95	58.5	6.18	68.5	16.96	65.4	46.40	46.1
11.0	9.32	7.0	28.93	54.9	6.24	65.4	16.87	61.8	46.49	44.6
21.0	9.47	7.2	29.01	51.3	6.35	62.3	16.93	58.3	46.61	43.1
30.9	9.65	7.3	29.20	47.8	6.50	59.3	17.13	54.8	46.76	41.7
Feb. 9.9	9.87	7.3	29.49	44.6	6.70	56.6	17.47	51.5	46.95	40.5
19.9	10.11	7.3	29.87	41.7	6.93	54.2	17.93	48.6	47.16	39.5
Mar. 1.9	10.37	7.2	30.32	39.3	7.20	52.3	18.49	46.1	47.40	38.8
11.8	10.65	7.0	30.84	37.4	7.49	50.8	19.15	44.2	47.65	38.3
21.8	10.94	6.6	31.41	36.2	7.80	49.9	19.87	42.8	47.92	38.1
31.8	11.24	6.2	32.00	35.6	8.13	49.6	20.63	42.1	48.20	38.3
Apr. 10.8	11.55	5.6	32.61	35.7	8.46	49.9	21.41	42.1	48.48	38.8
20.7	11.86	5.0	33.21	36.4	8.79	50.7	22.18	42.7	48.77	39.6
30.7	12.17	4.3	33.78	37.7	9.11	52.1	22.92	43.9	49.06	40.7
May 10.7	12.47	3.5	34.31	39.6	9.42	54.0	23.60	45.7	49.34	42.0
20.6	12.76	2.8	34.79	41.9	9.71	56.2	24.20	47.9	49.61	43.5
30.6	13.03	2.1	35.19	44.7	9.97	58.8	24.71	50.6	49.86	45.1
June 9.6	13.28	1.5	35.52	47.8	10.20	61.6	25.11	53.7	50.09	46.7
19.6	13.49	1.0	35.75	51.1	10.38	64.6	25.40	56.9	50.29	48.4
29.5	13.67	0.6	35.89	54.5	10.52	67.6	25.56	60.3	50.45	50.1
July 9.5	13.81	0.3	35.93	57.9	10.61	70.6	25.59	63.7	50.58	51.6
19.5	13.90	0.1	35.87	61.3	10.65	73.5	25.49	67.1	50.66	53.1
29.5	13.94	0.1	35.72	64.6	10.64	76.3	25.26	70.4	50.70	54.4
Aug. 8.4	13.94	0.2	35.47	67.6	10.57	78.8	24.91	73.5	50.70	55.5
18.4	13.90	0.3	35.13	70.3	10.46	81.1	24.45	76.3	50.66	56.4
28.4	13.81	0.6	34.71	72.8	10.30	83.1	23.88	78.8	50.58	57.2
Sept. 7.3	13.69	0.9	34.23	74.8	10.11	84.6	23.23	80.9	50.46	57.7
17.3	13.54	1.2	33.69	76.4	9.89	85.8	22.50	82.5	50.31	58.0
27.3	13.37	1.5	33.12	77.5	9.65	86.6	21.72	83.7	50.15	58.2
Oct. 7.3	13.19	1.8	32.52	78.0	9.40	86.9	20.91	84.4	49.98	58.1
17.2	13.01	2.1	31.91	78.1	9.14	86.8	20.09	84.6	49.80	57.9
27.2	12.85	2.4	31.31	77.6	8.90	86.1	19.27	84.2	49.64	57.4
Nov. 6.2	12.70	2.6	30.75	76.5	8.68	85.0	18.49	83.3	49.49	56.7
16.2	12.59	2.8	30.23	74.9	8.48	83.5	17.76	81.8	49.37	55.9
26.1	12.51	3.0	29.77	72.8	8.32	81.6	17.11	79.8	49.28	54.9
Dec. 6.1	12.47	3.2	29.38	70.2	8.20	79.2	16.56	77.4	49.23	53.7
16.1	12.47	3.4	29.09	67.3	8.13	76.6	16.12	74.5	49.22	52.4
26.0	12.52	3.5	28.90	64.0	8.11	73.7	15.80	71.3	49.24	51.0
36.0	12.61	3.7	28.81	60.5	8.14	70.6	15.62	67.8	49.31	49.5

## FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Cygni.		$\kappa$ Aquilæ.		$\beta$ Sagittæ.		$\gamma$ Aquilæ.		$\delta$ Cygni.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 19 26	° ' " +27 45	h m 19 31	° ' " - 7 13	h m 19 36	° ' " +17 15	h m 19 41	° ' " +10 23	h m 19 42	° ' " +44 53
Jan. 1.0	56.13	54.0	51.09	63.6	50.22	39.6	48.20	12.4	1.93	78.0
11.0	56.19 .06	51.3 2.7	51.18 .09	64.5 .09	50.28 .06	37.4 2.2	48.26 .06	10.6 1.8	1.94 .01	74.8 3.2
21.0	56.29 .10	48.6 2.7	51.30 .12	65.3 .08	50.38 .10	35.2 2.2	48.36 .10	8.8 1.8	2.00 .01	71.6 3.2
31.0	56.43 .14	46.0 2.6	51.45 .15	66.1 .08	50.51 .13	33.1 2.1	48.49 .13	7.1 1.7	2.12 .12	68.4 3.2
Feb. 9.9	56.60 .17	43.6 2.4	51.64 .19	66.7 .06	50.68 .17	31.2 1.9	48.65 .16	5.5 1.6	2.29 .17	65.4 3.0
	56.60 .21	43.6 2.1	51.64 .21	66.7 .05	50.68 .19	31.2 1.7	48.65 .19	5.5 1.3	2.29 .21	65.4 2.7
19.9	56.81	41.5	51.85	67.2	50.87	29.5	48.84	4.2	2.50	62.7
Mar. 1.9	57.05 .24	39.8 1.7	52.08 .23	67.5 .03	51.09 .22	28.2 1.3	49.06 .22	3.1 1.1	2.75 .25	60.4 2.3
11.9	57.31 .26	38.6 1.2	52.33 .25	67.5 .01	51.34 .25	27.2 1.0	49.30 .24	2.4 0.7	3.04 .06	58.7 1.7
21.8	57.59 .28	37.8 0.8	52.60 .27	67.5 .01	51.60 .26	26.6 0.6	49.56 .26	2.0 0.4	3.36 .32	57.4 1.3
31.8	57.88 .29	37.5 0.3	52.88 .28	67.1 .04	51.88 .28	26.5 0.1	49.83 .27	2.0 0.0	3.70 .34	56.8 0.6
	57.88 .31	37.5 0.3	52.88 .29	67.1 .06	51.88 .29	26.5 0.4	49.83 .28	2.0 0.4	3.70 .36	56.8 0.1
Apr. 10.8	58.19	37.8	53.17	66.5	52.17	26.9	50.11	2.4	4.06	56.7
20.7	58.50 .31	38.6 0.8	53.46 .29	65.7 .08	52.46 .29	27.7 0.8	50.40 .29	3.2 0.8	4.42 .36	57.3 0.6
30.7	58.80 .30	39.9 1.3	53.76 .30	64.7 .10	52.75 .29	27.7 1.2	50.70 .30	3.2 1.2	4.78 .29	57.3 1.1
May 10.7	59.10 .30	39.9 1.7	54.05 .29	64.7 .11	53.04 .29	28.9 1.5	51.00 .30	4.4 1.4	5.13 .35	58.4 1.7
20.7	59.38 .28	41.6 2.0	54.33 .28	63.6 1.2	53.32 .28	30.4 1.8	51.26 .27	5.8 1.7	5.46 .33	60.1 2.2
	59.38 .25	43.6 2.3	54.33 .27	62.4 1.3	53.32 .26	32.2 2.1	51.26 .26	7.5 1.8	5.46 .30	62.3 2.5
30.6	59.63	45.9	54.60	61.1	53.58	34.3	51.52	9.3	5.76	64.8
June 9.6	59.86 .23	48.5 2.6	54.84 .24	59.9 1.2	53.81 .23	36.5 2.2	51.76 .24	11.3 2.0	6.03 .27	67.6 2.8
19.6	60.06 .20	51.1 2.6	55.06 .22	58.7 1.2	54.02 .21	36.5 2.3	51.97 .21	11.3 2.1	6.03 .22	67.6 3.1
29.6	60.22 .16	53.9 2.8	55.24 .18	57.5 1.2	54.19 .17	38.8 2.3	52.15 .18	13.4 2.0	6.25 .17	70.7 3.2
July 9.5	60.33 .11	56.6 2.7	55.38 .14	56.5 1.0	54.32 .13	41.1 2.3	52.29 .14	15.4 2.0	6.42 .12	73.9 3.2
	60.33 .07	56.6 2.6	55.38 .10	56.5 0.9	54.32 .09	43.4 2.2	52.29 .10	17.4 1.9	6.54 .07	77.1 3.2
19.5	60.40	59.2	55.48	55.6	54.41	45.6	52.39	19.3	6.61	80.3
29.5	60.42 .02	61.7 2.5	55.54 .06	54.8 0.8	54.45 .04	47.7 2.1	52.44 .05	21.0 1.7	6.61 .00	83.4 3.1
Aug. 8.4	60.39 .03	64.0 2.3	55.56 .02	54.2 0.6	54.45 .00	47.7 1.9	52.44 .01	21.0 1.6	6.61 .05	83.4 2.9
18.4	60.32 .07	66.0 2.0	55.53 .03	54.2 0.5	54.45 .05	49.6 1.6	52.45 .04	22.6 1.4	6.56 .10	86.3 2.7
28.4	60.21 .11	67.7 1.7	55.53 .07	53.7 0.3	54.40 .09	51.2 1.4	52.41 .07	24.0 1.1	6.46 .15	89.0 2.4
	60.21 .15	67.7 1.4	55.46 .11	53.4 0.1	54.31 .12	52.6 1.1	52.34 .11	25.1 0.9	6.31 .20	91.4 2.0
Sept. 7.4	60.06	69.1	55.35	53.3	54.19	53.7	52.23	26.0	6.11	93.4
17.3	59.88 .18	70.2 1.1	55.21 .14	53.2 0.1	54.04 .15	54.6 0.9	52.09 .14	26.7 0.7	5.87 .24	95.0 1.6
27.3	59.68 .20	70.9 0.7	55.06 .15	53.2 0.1	53.87 .17	54.6 0.5	51.93 .16	27.0 0.3	5.61 .26	96.2 1.2
Oct. 7.3	59.47 .21	71.2 0.3	54.89 .17	53.3 0.2	53.68 .19	55.1 0.3	51.75 .18	27.0 0.1	5.61 .28	96.2 0.7
17.3	59.25 .22	71.1 0.1	54.72 .17	53.5 0.3	53.49 .19	55.4 0.1	51.57 .18	27.1 0.1	5.33 .28	96.9 0.3
	59.25 .21	71.1 0.5	54.72 .16	53.8 0.4	53.49 .18	55.3 0.5	51.57 .17	27.0 0.4	5.05 .29	97.2 0.3
27.2	59.04	70.6	54.56	54.2	53.31	54.8	51.40	26.6	4.76	96.9
Nov. 6.2	58.85 .19	69.8 0.8	54.41 .15	54.2 0.5	53.14 .17	54.1 0.7	51.25 .15	25.9 0.7	4.49 .27	96.2 0.7
16.2	58.69 .16	68.5 1.3	54.29 .12	54.7 0.6	53.00 .14	54.1 1.1	51.25 .14	25.9 0.9	4.49 .24	96.2 1.3
26.1	58.56 .13	66.8 1.7	54.20 .09	55.3 0.6	52.88 .12	53.0 1.3	51.11 .11	25.0 1.2	4.25 .22	94.9 1.7
Dec. 6.1	58.46 .10	64.8 2.0	54.15 .05	55.9 0.7	52.80 .08	51.7 1.6	51.00 .07	23.8 1.4	4.03 .17	93.2 2.2
	58.46 .06	64.8 2.3	54.15 .02	56.6 0.8	52.80 .05	50.1 1.9	50.93 .04	22.4 1.5	3.86 .12	91.0 2.6
16.1	58.40	62.5	54.13	57.4	52.75	48.2	50.89	20.9	3.74	88.4
26.1	58.39 .01	60.0 2.5	54.15 .02	58.3 0.9	52.75 .00	46.1 2.1	50.89 .00	19.2 1.7	3.66 .08	85.6 2.8
36.0	58.42 .03	57.4 2.6	54.22 .07	59.1 0.8	52.79 .04	44.0 2.1	50.93 .04	17.4 1.8	3.64 .02	82.5 3.1

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Aquilæ. (Altair.)		$\epsilon$ Draconis.		$\epsilon$ Pavonis.		$\beta$ Aquilæ.		$\gamma$ Sagittæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 19 46	° ' " + 8 37	h m 19 48	° ' " + 70 1	h m 19 49	° ' " - 73 9	h m 19 50	° ' " + 6 10	h m 19 54	° ' " + 19 14
Jan. 1.1	12.65	22.0	26.34	59.5	43.80	27.4	42.60	28.3	35.22	24.0
11.0	12.71	20.3	26.20	56.1	43.91	24.5	42.66	26.6	35.25	21.8
21.0	12.81	18.6	26.18	52.6	44.16	21.6	42.75	25.0	35.33	19.6
31.0	12.94	17.0	26.28	49.1	44.53	18.7	42.88	23.5	35.44	17.4
Feb. 9.9	13.10	15.5	26.50	45.7	45.02	15.9	43.03	22.2	35.59	15.4
19.9	13.29	14.2	26.82	42.6	45.61	13.2	43.22	21.1	35.77	13.6
Mar. 1.9	13.50	13.2	27.25	39.9	46.30	10.8	43.43	20.2	35.98	12.2
11.9	13.74	12.6	27.76	37.6	47.06	8.7	43.66	19.6	36.21	11.1
21.8	14.00	12.3	28.34	36.0	47.89	6.9	43.91	19.3	36.47	10.5
31.8	14.27	12.4	28.97	34.9	48.76	5.5	44.18	19.4	36.74	10.3
Apr. 10.8	14.55	12.8	29.63	34.5	49.67	4.4	44.46	19.9	37.03	10.5
20.8	14.84	13.6	30.30	34.7	50.59	3.8	44.75	20.7	37.32	11.2
30.7	15.13	14.8	30.96	35.6	51.51	3.6	45.04	21.8	37.62	12.4
May 10.7	15.42	16.2	31.58	37.1	52.41	3.8	45.33	23.2	37.92	13.9
20.7	15.70	17.9	32.16	39.1	53.28	4.4	45.62	24.8	38.21	15.7
30.6	15.97	19.7	32.67	41.5	54.09	5.4	45.88	26.5	38.48	17.8
June 9.6	16.21	21.6	33.10	44.4	54.83	6.8	46.13	28.3	38.73	20.0
19.6	16.43	23.6	33.44	47.5	55.48	8.6	46.35	30.2	38.95	22.4
29.6	16.61	25.6	33.67	50.9	56.03	10.7	46.54	32.1	39.13	24.9
July 9.5	16.76	27.6	33.80	54.4	56.45	13.1	46.69	33.9	39.28	27.3
19.5	16.86	29.4	33.82	57.9	56.75	15.6	46.80	35.6	39.38	29.7
29.5	16.92	31.0	33.73	61.3	56.91	18.2	46.86	37.1	39.44	31.9
Aug. 8.5	16.94	32.5	33.53	64.6	56.92	20.9	46.88	38.5	39.45	33.9
18.4	16.91	33.8	33.22	67.7	56.79	23.5	46.86	39.6	39.42	35.7
28.4	16.84	34.9	32.82	70.5	56.53	26.0	46.80	40.6	39.34	37.3
Sept. 7.4	16.73	35.8	32.34	73.0	56.15	28.2	46.70	41.3	39.23	38.6
17.3	16.60	36.4	31.79	75.1	55.66	30.1	46.57	41.8	39.09	39.6
27.3	16.45	36.7	31.18	76.7	55.09	31.6	46.41	42.1	38.92	40.3
Oct. 7.3	16.28	36.8	30.53	77.9	54.46	32.6	46.25	42.2	38.74	40.7
17.3	16.10	36.7	29.86	78.5	53.81	33.2	46.08	42.0	38.55	40.7
27.2	15.93	36.3	29.19	78.6	53.15	33.2	45.91	41.6	38.36	40.4
Nov. 6.2	15.78	35.7	28.53	78.1	52.53	32.6	45.75	41.0	38.19	39.7
16.2	15.64	34.8	27.90	77.0	51.97	31.6	45.62	40.2	38.03	38.8
26.2	15.53	33.8	27.32	75.4	51.49	30.0	45.51	39.1	37.90	37.5
Dec. 6.1	15.46	32.5	26.82	73.3	51.13	28.0	45.43	37.9	37.81	35.9
16.1	15.42	31.0	26.40	70.7	50.89	25.6	45.39	36.5	37.75	34.1
26.1	15.42	29.4	26.08	67.8	50.78	23.0	45.39	35.0	37.73	32.1
36.0	15.46	27.7	25.86	64.5	50.81	20.2	45.42	33.5	37.74	29.9

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♈ Sagittarii.		♐ Aquilæ.		♑ Aquilæ.		♒ Cygni.		♓ Cephei (pr.).	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 19 56	° ' " -27 57	h m 19 59	° ' " + 7 0	h m 20 6	° ' " - 1 5	h m 20 10	° ' " +46 27	h m 20 11	° ' " +77 25
	s 19 56	" -27 57	s 19 59	" + 7 0	s 20 6	" - 1 5	s 20 10	" +46 27	s 20 11	" +77 25
Jan. 1.1	53.90	70.3	33.75	56.5	28.28	51.6	40.10	38.9	57.86	63.2
11.0	53.97	69.8	33.79	54.9	28.33	52.7	40.07	35.8	57.48	60.0
21.0	54.08	69.2	33.88	53.3	28.41	53.8	40.09	32.6	57.28	56.6
31.0	54.23	68.6	33.99	51.8	28.53	54.8	40.17	29.4	57.27	53.1
Feb. 10.0	54.42	68.0	34.14	50.5	28.67	55.7	40.30	26.4	57.46	49.6
19.9	54.63	67.2	34.32	49.3	28.85	56.4	40.48	23.6	57.83	46.4
Mar. 1.9	54.87	66.4	34.52	48.4	29.05	56.9	40.70	21.1	58.37	43.5
11.9	55.14	65.6	34.75	47.8	29.27	57.2	40.97	19.1	59.06	41.0
21.8	55.43	64.7	34.99	47.5	29.52	57.1	41.27	17.6	59.88	39.0
31.8	55.74	63.8	35.26	47.6	29.78	56.8	41.60	16.7	60.79	37.6
10.8	56.06	62.8	35.54	48.1	30.06	56.2	41.96	16.4	61.76	36.8
20.8	56.39	61.9	35.83	48.9	30.35	55.3	42.33	16.7	62.77	36.7
30.7	56.73	61.0	36.12	50.0	30.64	54.2	42.70	17.6	63.77	37.2
May 10.7	57.06	60.1	36.41	51.4	30.94	52.9	43.07	19.0	64.74	38.3
20.7	57.39	59.4	36.70	53.0	31.23	51.5	43.42	20.9	65.64	39.9
30.7	57.71	58.8	36.97	54.8	31.51	49.9	43.75	23.3	66.44	42.1
June 9.6	58.00	58.3	37.22	56.7	31.77	48.3	44.05	26.0	67.13	44.7
19.6	58.27	58.0	37.45	58.6	32.00	46.7	44.30	29.0	67.68	47.6
29.6	58.50	57.8	37.64	60.5	32.21	45.1	44.51	32.1	68.08	50.8
July 9.5	58.69	57.9	37.80	62.4	32.38	43.6	44.67	35.4	68.31	54.2
19.5	58.83	58.1	37.92	64.2	32.50	42.3	44.77	38.7	68.38	57.7
29.5	58.93	58.5	37.99	65.8	32.59	41.1	44.81	41.9	68.28	61.2
Aug. 8.5	58.98	59.0	38.02	67.2	32.63	40.0	44.80	45.0	68.01	64.6
18.4	58.97	59.7	38.00	68.5	32.63	39.2	44.73	47.9	67.58	67.9
28.4	58.92	60.4	37.94	69.6	32.58	38.5	44.60	50.5	67.00	70.9
7.4	58.82	61.1	37.85	70.4	32.50	38.1	44.43	52.8	66.28	73.7
17.4	58.69	61.9	37.72	71.0	32.38	37.8	44.21	54.8	65.45	76.1
27.3	58.53	62.6	37.57	71.3	32.24	37.7	43.96	56.3	64.52	78.1
Oct. 7.3	58.35	63.2	37.41	71.4	32.08	37.7	43.69	57.4	63.51	79.7
17.3	58.17	63.7	37.24	71.3	31.92	38.0	43.40	58.0	62.45	80.8
27.2	57.98	64.1	37.07	71.0	31.76	38.4	43.11	58.2	61.36	81.4
Nov. 6.2	57.81	64.4	36.91	70.4	31.60	38.9	42.82	57.8	60.28	81.4
16.2	57.67	64.5	36.77	69.6	31.47	39.5	42.56	56.9	59.22	80.8
26.2	57.55	64.4	36.66	68.6	31.36	40.3	42.32	55.5	58.22	79.6
Dec. 6.1	57.47	64.3	36.58	67.4	31.28	41.2	42.12	53.6	57.31	77.9
16.1	57.44	64.0	36.53	66.0	31.24	42.2	41.96	51.3	56.52	75.7
26.1	57.45	63.7	36.52	64.5	31.23	43.3	41.84	48.6	55.86	73.0
36.1	57.50	63.3	36.55	63.0	31.26	44.4	41.78	45.7	55.36	70.0

# FIXED STARS, 1907.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha^*$ Capricorni.		$\alpha$ Pavonis.		$\gamma$ Cygni.		$\pi$ Capricorni.		$\epsilon$ Delphini.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 20 12	° ' " -12 49	h m 20 18	° ' " -57 1	h m 20 18	° ' " +39 57	h m 20 21	° ' " -18 30	h m 20 28	° ' " +10 59
Jan. 1.1	51.49	62.3	13.75	67.6	51.39	37.1	57.63	63.7	44.23	13.8
11.0	51.54 <sup>.05</sup>	62.7 <sup>.04</sup>	13.80 <sup>.05</sup>	65.4 <sup>2.2</sup>	51.37 <sup>.02</sup>	34.2 <sup>2.9</sup>	57.67 <sup>.04</sup>	63.8 <sup>0.1</sup>	44.24 <sup>.01</sup>	12.1 <sup>1.7</sup>
21.0	51.62 <sup>.08</sup>	63.0 <sup>0.3</sup>	13.91 <sup>.11</sup>	63.2 <sup>2.2</sup>	51.40 <sup>.03</sup>	31.2 <sup>3.0</sup>	57.75 <sup>.08</sup>	63.8 <sup>0.0</sup>	44.29 <sup>.05</sup>	10.4 <sup>1.7</sup>
31.0	51.74 <sup>.12</sup>	63.3 <sup>0.3</sup>	14.09 <sup>.18</sup>	60.8 <sup>2.4</sup>	51.47 <sup>.07</sup>	28.3 <sup>2.9</sup>	57.86 <sup>.11</sup>	63.7 <sup>0.1</sup>	44.38 <sup>.09</sup>	8.7 <sup>1.7</sup>
Feb. 10.0	51.89 <sup>.15</sup>	63.5 <sup>0.2</sup>	14.33 <sup>.24</sup>	58.5 <sup>2.3</sup>	51.59 <sup>.12</sup>	25.4 <sup>2.9</sup>	58.00 <sup>.14</sup>	63.5 <sup>0.2</sup>	44.50 <sup>.12</sup>	7.2 <sup>1.5</sup>
19.9	52.07 <sup>.18</sup>	63.5 <sup>0.0</sup>	14.33 <sup>.30</sup>	58.5 <sup>2.3</sup>	51.59 <sup>.16</sup>	25.4 <sup>2.6</sup>	58.00 <sup>.18</sup>	63.5 <sup>0.3</sup>	44.50 <sup>.15</sup>	7.2 <sup>1.3</sup>
Mar. 1.9	52.27 <sup>.20</sup>	63.4 <sup>0.1</sup>	14.63 <sup>.34</sup>	56.2 <sup>2.2</sup>	51.75 <sup>.20</sup>	22.8 <sup>2.3</sup>	58.18 <sup>.21</sup>	63.2 <sup>0.5</sup>	44.65 <sup>.17</sup>	5.9 <sup>1.1</sup>
11.9	52.27 <sup>.23</sup>	63.4 <sup>0.3</sup>	14.97 <sup>.39</sup>	54.0 <sup>2.1</sup>	51.95 <sup>.24</sup>	20.5 <sup>1.9</sup>	58.39 <sup>.23</sup>	62.7 <sup>0.6</sup>	44.82 <sup>.21</sup>	4.8 <sup>0.8</sup>
21.9	52.50 <sup>.23</sup>	63.1 <sup>0.5</sup>	15.36 <sup>.43</sup>	51.9 <sup>1.9</sup>	52.19 <sup>.28</sup>	18.6 <sup>1.4</sup>	58.62 <sup>.25</sup>	62.1 <sup>0.7</sup>	45.03 <sup>.23</sup>	4.0 <sup>0.4</sup>
31.8	52.75 <sup>.27</sup>	62.6 <sup>0.6</sup>	15.79 <sup>.46</sup>	50.0 <sup>1.7</sup>	52.47 <sup>.30</sup>	17.2 <sup>0.8</sup>	58.87 <sup>.27</sup>	61.4 <sup>0.9</sup>	45.26 <sup>.25</sup>	3.6 <sup>0.1</sup>
Apr. 10.8	53.02 <sup>.29</sup>	62.0 <sup>0.8</sup>	16.25 <sup>.48</sup>	48.3 <sup>1.4</sup>	52.77 <sup>.32</sup>	16.4 <sup>0.3</sup>	59.14 <sup>.29</sup>	60.5 <sup>1.0</sup>	45.51 <sup>.27</sup>	3.5 <sup>0.4</sup>
20.8	53.31 <sup>.30</sup>	61.2 <sup>1.0</sup>	16.73 <sup>.51</sup>	46.9 <sup>1.2</sup>	53.09 <sup>.34</sup>	16.1 <sup>0.3</sup>	59.43 <sup>.31</sup>	59.5 <sup>1.0</sup>	45.78 <sup>.28</sup>	3.9 <sup>0.7</sup>
30.7	53.61 <sup>.30</sup>	60.2 <sup>1.1</sup>	17.24 <sup>.51</sup>	45.7 <sup>0.8</sup>	53.43 <sup>.34</sup>	16.4 <sup>0.9</sup>	59.74 <sup>.31</sup>	58.5 <sup>1.2</sup>	46.06 <sup>.30</sup>	4.6 <sup>1.1</sup>
May 10.7	53.91 <sup>.31</sup>	59.1 <sup>1.2</sup>	17.75 <sup>.52</sup>	44.9 <sup>0.5</sup>	53.77 <sup>.35</sup>	17.3 <sup>1.4</sup>	60.05 <sup>.32</sup>	57.3 <sup>1.2</sup>	46.36 <sup>.30</sup>	5.7 <sup>1.4</sup>
20.7	54.22 <sup>.30</sup>	57.9 <sup>1.3</sup>	18.27 <sup>.51</sup>	44.4 <sup>0.2</sup>	54.12 <sup>.33</sup>	18.7 <sup>1.9</sup>	60.37 <sup>.31</sup>	56.1 <sup>1.1</sup>	46.66 <sup>.29</sup>	7.1 <sup>1.7</sup>
30.7	54.52 <sup>.29</sup>	56.6 <sup>1.2</sup>	18.78 <sup>.49</sup>	44.2 <sup>0.1</sup>	54.45 <sup>.31</sup>	20.6 <sup>2.3</sup>	60.68 <sup>.31</sup>	55.0 <sup>1.1</sup>	46.95 <sup>.29</sup>	8.8 <sup>1.9</sup>
June 9.6	54.81 <sup>.28</sup>	55.4 <sup>1.2</sup>	19.27 <sup>.46</sup>	44.3 <sup>0.5</sup>	54.76 <sup>.29</sup>	22.9 <sup>2.6</sup>	60.99 <sup>.29</sup>	53.9 <sup>1.0</sup>	47.24 <sup>.27</sup>	10.7 <sup>2.0</sup>
19.6	55.09 <sup>.25</sup>	54.2 <sup>1.1</sup>	19.73 <sup>.41</sup>	44.8 <sup>0.9</sup>	55.05 <sup>.25</sup>	25.5 <sup>2.8</sup>	61.28 <sup>.26</sup>	52.9 <sup>0.9</sup>	47.51 <sup>.24</sup>	12.7 <sup>2.1</sup>
29.6	55.34 <sup>.22</sup>	53.1 <sup>1.0</sup>	20.14 <sup>.37</sup>	45.7 <sup>1.2</sup>	55.30 <sup>.22</sup>	28.3 <sup>3.1</sup>	61.54 <sup>.24</sup>	52.0 <sup>0.8</sup>	47.75 <sup>.21</sup>	14.8 <sup>2.2</sup>
July 9.6	55.56 <sup>.19</sup>	52.1 <sup>0.9</sup>	20.51 <sup>.31</sup>	46.9 <sup>1.5</sup>	55.52 <sup>.17</sup>	31.4 <sup>3.1</sup>	61.78 <sup>.20</sup>	51.2 <sup>0.6</sup>	47.96 <sup>.18</sup>	17.0 <sup>2.1</sup>
19.5	55.75 <sup>.14</sup>	51.2 <sup>0.7</sup>	20.82 <sup>.24</sup>	48.4 <sup>1.7</sup>	55.69 <sup>.11</sup>	34.5 <sup>3.2</sup>	61.98 <sup>.16</sup>	50.6 <sup>0.4</sup>	48.14 <sup>.14</sup>	19.1 <sup>2.0</sup>
Aug. 8.5	55.89 <sup>.10</sup>	50.5 <sup>0.6</sup>	21.06 <sup>.16</sup>	50.1 <sup>1.9</sup>	55.80 <sup>.06</sup>	37.7 <sup>3.0</sup>	62.14 <sup>.11</sup>	50.2 <sup>0.3</sup>	48.28 <sup>.10</sup>	21.1 <sup>1.9</sup>
18.4	55.99 <sup>.06</sup>	49.9 <sup>0.4</sup>	21.22 <sup>.08</sup>	52.0 <sup>2.0</sup>	55.86 <sup>.01</sup>	40.7 <sup>3.0</sup>	62.25 <sup>.06</sup>	49.9 <sup>0.0</sup>	48.38 <sup>.05</sup>	23.0 <sup>1.8</sup>
28.4	56.05 <sup>.01</sup>	49.5 <sup>0.2</sup>	21.30 <sup>.01</sup>	54.0 <sup>2.1</sup>	55.87 <sup>.04</sup>	43.7 <sup>2.7</sup>	62.31 <sup>.02</sup>	49.9 <sup>0.1</sup>	48.43 <sup>.01</sup>	24.8 <sup>1.5</sup>
Sept. 7.4	56.06 <sup>.04</sup>	49.3 <sup>0.0</sup>	21.31 <sup>.07</sup>	56.1 <sup>2.1</sup>	55.83 <sup>.10</sup>	46.4 <sup>2.5</sup>	62.33 <sup>.02</sup>	50.0 <sup>0.2</sup>	48.44 <sup>.03</sup>	26.3 <sup>1.3</sup>
17.4	56.02 <sup>.08</sup>	49.3 <sup>0.1</sup>	21.24 <sup>.14</sup>	58.2 <sup>2.0</sup>	55.73 <sup>.14</sup>	48.9 <sup>2.2</sup>	62.31 <sup>.07</sup>	50.2 <sup>0.4</sup>	48.41 <sup>.07</sup>	27.6 <sup>1.1</sup>
Oct. 7.3	55.94 <sup>.11</sup>	49.4 <sup>0.2</sup>	21.10 <sup>.21</sup>	60.2 <sup>1.8</sup>	55.59 <sup>.18</sup>	51.1 <sup>1.9</sup>	62.24 <sup>.11</sup>	50.6 <sup>0.4</sup>	48.34 <sup>.11</sup>	28.7 <sup>0.9</sup>
17.3	55.83 <sup>.13</sup>	49.6 <sup>0.3</sup>	20.89 <sup>.26</sup>	62.0 <sup>1.5</sup>	55.41 <sup>.21</sup>	53.0 <sup>1.4</sup>	62.13 <sup>.14</sup>	51.0 <sup>0.5</sup>	48.23 <sup>.14</sup>	29.6 <sup>0.6</sup>
27.3	55.70 <sup>.16</sup>	49.9 <sup>0.3</sup>	20.63 <sup>.29</sup>	63.5 <sup>1.3</sup>	55.20 <sup>.23</sup>	54.4 <sup>1.1</sup>	61.99 <sup>.15</sup>	51.5 <sup>0.5</sup>	48.09 <sup>.15</sup>	30.2 <sup>0.3</sup>
Nov. 6.2	55.54 <sup>.17</sup>	50.2 <sup>0.4</sup>	20.34 <sup>.32</sup>	64.8 <sup>0.9</sup>	54.97 <sup>.24</sup>	55.5 <sup>0.5</sup>	61.84 <sup>.16</sup>	52.0 <sup>0.6</sup>	47.94 <sup>.17</sup>	30.5 <sup>0.0</sup>
16.2	55.37 <sup>.16</sup>	50.6 <sup>0.4</sup>	20.02 <sup>.32</sup>	65.7 <sup>0.5</sup>	54.73 <sup>.25</sup>	56.0 <sup>0.2</sup>	61.68 <sup>.17</sup>	52.6 <sup>0.5</sup>	47.77 <sup>.17</sup>	30.5 <sup>0.2</sup>
26.2	55.21 <sup>.15</sup>	51.0 <sup>0.5</sup>	19.70 <sup>.31</sup>	66.2 <sup>0.0</sup>	54.48 <sup>.25</sup>	56.2 <sup>0.4</sup>	61.51 <sup>.16</sup>	53.1 <sup>0.4</sup>	47.60 <sup>.16</sup>	30.3 <sup>0.5</sup>
Dec. 6.1	55.06 <sup>.14</sup>	51.5 <sup>0.5</sup>	19.39 <sup>.29</sup>	66.2 <sup>0.4</sup>	54.23 <sup>.22</sup>	55.8 <sup>0.8</sup>	61.35 <sup>.14</sup>	53.5 <sup>0.4</sup>	47.44 <sup>.15</sup>	29.8 <sup>0.7</sup>
16.1	54.92 <sup>.11</sup>	52.0 <sup>0.5</sup>	19.10 <sup>.24</sup>	65.8 <sup>0.8</sup>	54.01 <sup>.21</sup>	55.0 <sup>1.3</sup>	61.21 <sup>.12</sup>	53.9 <sup>0.3</sup>	47.29 <sup>.13</sup>	29.1 <sup>0.9</sup>
26.1	54.81 <sup>.08</sup>	52.5 <sup>0.4</sup>	18.86 <sup>.19</sup>	65.0 <sup>1.2</sup>	53.80 <sup>.17</sup>	53.7 <sup>1.8</sup>	61.09 <sup>.09</sup>	54.2 <sup>0.3</sup>	47.16 <sup>.10</sup>	28.2 <sup>1.2</sup>
36.1	54.73 <sup>.04</sup>	52.9 <sup>0.5</sup>	18.67 <sup>.13</sup>	63.8 <sup>1.5</sup>	53.63 <sup>.14</sup>	51.9 <sup>2.1</sup>	61.00 <sup>.05</sup>	54.5 <sup>0.2</sup>	47.06 <sup>.07</sup>	27.0 <sup>1.4</sup>
Jan. 16.1	54.69 <sup>.01</sup>	53.4 <sup>0.5</sup>	18.54 <sup>.06</sup>	62.3 <sup>1.8</sup>	53.49 <sup>.09</sup>	49.8 <sup>2.5</sup>	60.95 <sup>.01</sup>	54.7 <sup>0.2</sup>	46.99 <sup>.04</sup>	25.6 <sup>1.5</sup>
26.1	54.68 <sup>.03</sup>	53.9 <sup>0.4</sup>	18.48 <sup>.01</sup>	60.5 <sup>2.1</sup>	53.40 <sup>.05</sup>	47.3 <sup>2.7</sup>	60.94 <sup>.02</sup>	54.9 <sup>0.1</sup>	46.95 <sup>.00</sup>	24.1 <sup>1.7</sup>
36.1	54.71	54.3	18.49	58.4	53.35	44.6	60.96	55.0	46.95	22.4

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 3241.			$\alpha$ Delphini.			$\beta$ Pavonis.			$\alpha$ Cygni.			$\psi$ Capricorni.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.	
	h m 20 30	° +72 12		h m 20 35	° +15 34		h m 20 36	° -66 31		h m 20 38	° +44 56		h m 20 40	° -25 36	
	s	"		s	"		s	"		s	"		s	"	
Jan. 1.1	21.74	69.6	17.18	63.8	30.18	85.8	13.67	58.6	33.07	24.3					
	.29	3.1	.00	1.9	.02	2.6	.06	2.9	.03						
11.1	21.45	66.5	17.18	61.9	30.16	83.2	13.61	55.7	33.10	23.9					
	.17	3.3	.04	1.9	.08	2.8	.01	3.0	.06						
21.0	21.28	63.2	17.22	60.0	30.24	80.4	13.60	52.7	33.16	23.4					
	.03	3.5	.07	1.9	.17	2.8	.04	3.1	.10						
31.0	21.25	59.7	17.29	58.1	30.41	77.6	13.64	49.6	33.26	22.8					
	.10	3.4	.11	1.8	.26	2.9	.09	3.0	.13						
Feb. 10.0	21.35	56.3	17.40	56.3	30.67	74.7	13.73	46.6	33.39	22.1					
	.23	3.3	.14	1.6	.34	2.8	.14	2.8	.17						
19.9	21.58	53.0	17.54	54.7	31.01	71.9	13.87	43.8	33.56	21.3					
	.35	3.1	.17	1.3	.41	2.7	.19	2.5	.20						
Mar. 1.9	21.93	49.9	17.71	53.4	31.42	69.2	14.06	41.3	33.76	20.4					
	.46	2.6	.20	0.9	.48	2.5	.24	2.1	.22						
11.9	22.39	47.3	17.91	52.5	31.90	66.7	14.30	39.2	33.98	19.4					
	.56	2.1	.23	0.6	.54	2.3	.27	1.7	.25						
21.9	22.95	45.2	18.14	51.9	32.44	64.4	14.57	37.5	34.23	18.3					
	.64	1.6	.25	0.2	.59	2.0	.31	1.1	.28						
31.8	23.59	43.6	18.39	51.7	33.03	62.4	14.88	36.4	34.51	17.1					
	.70	0.9	.27	0.2	.63	1.8	.33	0.5	.29						
Apr. 10.8	24.29	42.7	18.66	51.9	33.66	60.6	15.21	35.9	34.80	15.8					
	.73	0.3	.29	0.6	.65	1.4	.35	0.1	.32						
20.8	25.02	42.4	18.95	52.5	34.31	59.2	15.56	36.0	35.12	14.6					
	.74	0.3	.29	1.0	.68	1.0	.37	0.6	.32						
30.8	25.76	42.7	19.24	53.5	34.99	58.2	15.93	36.6	35.44	13.3					
	.73	1.0	.30	1.4	.68	0.6	.37	1.2	.34						
May 10.7	26.49	43.7	19.54	54.9	35.67	57.6	16.30	37.8	35.78	12.1					
	.69	1.5	.30	1.7	.67	0.2	.36	1.7	.33						
20.7	27.18	45.2	19.84	56.6	36.34	57.4	16.66	39.5	36.11	11.0					
	.63	2.0	.29	2.0	.65	0.2	.34	2.2	.33						
30.7	27.81	47.2	20.13	58.6	36.99	57.6	17.00	41.7	36.44	9.9					
	.56	2.5	.27	2.1	.62	0.6	.32	2.5	.31						
June 9.6	28.37	49.7	20.40	60.7	37.61	58.2	17.32	44.2	36.75	9.0					
	.47	2.9	.25	2.3	.57	1.0	.28	2.9	.29						
19.6	28.84	52.6	20.65	63.0	38.18	59.2	17.60	47.1	37.04	8.3					
	.37	3.2	.22	2.3	.50	1.4	.24	3.1	.26						
29.6	29.21	55.8	20.87	65.3	38.68	60.6	17.84	50.2	37.30	7.8					
	.25	3.4	.19	2.3	.43	1.8	.19	3.2	.23						
July 9.6	29.46	59.2	21.06	67.6	39.11	62.4	18.03	53.4	37.53	7.5					
	.14	3.5	.14	2.3	.33	2.0	.14	3.3	.18						
19.5	29.60	62.7	21.20	69.9	39.44	64.4	18.17	56.7	37.71	7.4					
	.01	3.6	.10	2.2	.24	2.3	.08	3.2	.14						
29.5	29.61	66.3	21.30	72.1	39.68	66.7	18.25	59.9	37.85	7.6					
	.10	3.5	.06	1.9	.13	2.4	.03	3.1	.09						
Aug. 8.5	29.51	69.8	21.36	74.0	39.81	69.1	18.28	63.0	37.94	7.9					
	.23	3.4	.01	1.8	.03	2.5	.03	3.0	.04						
18.5	29.28	73.2	21.37	75.8	39.84	71.6	18.25	66.0	37.98	8.4					
	.34	3.2	.03	1.6	.07	2.5	.14	2.8	.01						
28.4	28.94	76.4	21.34	77.4	39.77	74.1	18.16	68.8	37.97	9.0					
	.44	2.9	.07	1.3	.18	2.4	.14	2.5	.06						
Sept. 7.4	28.50	79.3	21.27	78.7	39.59	76.5	18.02	71.3	37.91	9.8					
	.53	2.6	.11	1.1	.26	2.1	.18	2.2	.09						
17.4	27.97	81.9	21.16	79.8	39.33	78.6	17.84	73.5	37.82	10.6					
	.61	2.2	.14	0.8	.34	1.9	.21	1.7	.13						
27.3	27.36	84.1	21.02	80.6	38.99	80.5	17.63	75.2	37.69	11.4					
	.67	1.8	.16	0.5	.40	1.6	.25	1.4	.16						
Oct. 7.3	26.69	85.9	20.86	81.1	38.59	82.1	17.38	76.6	37.53	12.2					
	.71	1.3	.17	0.2	.44	1.1	.26	0.9	.17						
17.3	25.98	87.2	20.69	81.3	38.15	83.2	17.12	77.5	37.36	12.9					
	.74	0.8	.17	0.1	.46	0.6	.27	0.4	.17						
27.3	25.24	88.0	20.52	81.2	37.69	83.8	16.85	77.9	37.19	13.5					
	.75	0.2	.17	0.4	.45	0.1	.27	0.1	.17						
Nov. 6.2	24.49	88.2	20.35	80.8	37.24	83.9	16.58	77.8	37.02	14.0					
	.73	0.4	.15	0.7	.43	0.3	.25	0.5	.15						
16.2	23.76	87.8	20.20	80.1	36.81	83.6	16.33	77.3	36.87	14.4					
	.69	0.9	.14	1.0	.38	0.9	.24	1.1	.13						
26.2	23.07	86.9	20.06	79.1	36.43	82.7	16.09	76.2	36.74	14.6					
	.64	1.5	.11	1.3	.32	1.4	.18	1.6	.11						
Dec. 6.2	22.43	85.4	19.95	77.8	36.11	81.3	15.88	74.6	36.63	14.7					
	.56	2.1	.08	1.5	.24	1.8	.21	2.0	.07						
16.1	21.87	83.3	19.87	76.3	35.87	79.5	15.70	72.6	36.56	14.6					
	.47	2.5	.05	1.6	.16	2.1	.13	2.4	.03						
26.1	21.40	80.8	19.82	74.7	35.71	77.4	15.57	70.2	36.53	14.4					
	.37	2.9	.02	1.9	.06	2.4	.09	2.7	.00						
36.1	21.03	77.9	19.80	72.8	35.65	75.0	15.48	67.5	36.53	14.1					

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

389

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Cygni.		μ Aquarii.		12 Year Cat. 1879.		ν Cygni.		61 Cygni.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 20 42	° ' " +33 37	h m 20 47	° ' " - 9 19	h m 20 51	° ' " +80 11	h m 20 53	° ' " +40 48	h m 21 2	° ' " +38 17
	s	"	s	"	s	"	s	"	s	"
Jan. 1.1	24.99 .03	22.9 2.6	36.22 .01	60.6 0.6	45.44 0.71	85.3 2.9	40.44 .06	38.0 2.7	41.78 .06	36.4 2.5
11.1	24.96 .01	20.3 2.6	36.23 .05	61.2 0.5	44.73 0.49	82.4 3.1	40.38 .02	35.3 2.8	41.72 .02	33.9 2.6
21.1	24.97 .05	17.7 2.7	36.28 .08	61.7 0.4	44.24 0.26	79.3 3.4	40.36 .02	32.5 2.9	41.70 .03	31.3 2.7
31.0	25.02 .09	15.0 2.6	36.36 .11	62.1 0.3	43.98 0.01	75.9 3.4	40.38 .07	29.6 2.8	41.73 .08	28.6 2.7
Feb. 10.0	25.11 .13	12.4 2.4	36.47 .14	62.4 0.2	43.97 0.23	72.5 3.3	40.45 .12	26.8 2.7	41.81 .11	25.9 2.5
20.0	25.24 .17	10.0 2.1	36.61 .17	62.5 0.1	44.20 0.47	69.2 3.2	40.57 .17	24.1 2.4	41.92 .16	23.4 2.2
Mar. 1.9	25.41 .21	7.9 1.7	36.78 .20	62.4 0.2	44.67 0.68	66.0 2.8	40.74 .21	21.7 2.1	42.08 .21	21.2 1.9
11.9	25.62 .24	6.2 1.3	36.98 .22	62.2 0.4	45.35 0.88	63.2 2.4	40.95 .24	19.6 1.6	42.29 .24	19.3 1.5
21.9	25.86 .27	4.9 0.8	37.20 .25	61.8 0.7	46.23 1.03	60.8 1.9	41.19 .28	18.0 1.1	42.53 .27	17.8 1.0
31.9	26.13 .30	4.1 0.3	37.45 .27	61.1 0.9	47.26 1.16	58.9 1.3	41.47 .31	16.9 0.6	42.80 .31	16.8 0.5
Apr. 10.8	26.43 .31	3.8 0.2	37.72 .28	60.2 1.1	48.42 1.23	57.6 0.7	41.78 .33	16.3 0.0	43.11 .33	16.3 0.1
20.8	26.74 .32	4.0 0.8	38.00 .30	59.1 1.2	49.65 1.26	56.9 0.0	42.11 .35	16.3 0.6	43.44 .34	16.4 0.7
30.8	27.06 .33	4.8 1.3	38.30 .31	57.9 1.4	50.91 1.26	56.9 0.5	42.46 .35	16.9 1.1	43.78 .36	17.1 1.1
May 10.7	27.39 .33	6.1 1.7	38.61 .30	56.5 1.5	52.17 1.20	57.4 1.2	42.81 .35	18.0 1.6	44.14 .35	18.2 1.7
20.7	27.72 .31	7.8 2.1	38.91 .30	55.0 1.5	53.37 1.12	58.6 1.7	43.16 .34	19.6 2.1	44.49 .35	19.9 2.1
30.7	28.03 .30	9.9 2.5	39.21 .29	53.5 1.5	54.49 0.99	60.3 2.2	43.50 .32	21.7 2.4	44.84 .32	22.0 2.4
June 9.7	28.33 .26	12.4 2.7	39.50 .27	52.0 1.4	55.48 0.85	62.5 2.6	43.82 .28	24.1 2.8	45.16 .30	24.4 2.8
19.6	28.59 .23	15.1 2.9	39.77 .24	50.6 1.3	56.33 0.67	65.1 2.9	44.10 .25	26.9 2.9	45.46 .26	27.2 3.0
29.6	28.82 .20	18.0 2.9	40.01 .21	49.3 1.2	57.00 0.48	68.0 3.3	44.35 .21	29.8 3.1	45.72 .23	30.2 3.1
July 9.6	29.02 .14	20.9 3.0	40.22 .18	48.1 1.0	57.48 0.28	71.3 3.4	44.56 .16	32.9 3.2	45.95 .17	33.3 3.2
19.6	29.16 .10	23.9 2.9	40.40 .13	47.1 0.8	57.76 0.07	74.7 3.5	44.72 .10	36.1 3.2	46.12 .13	36.5 3.2
29.5	29.26 .05	26.8 2.8	40.53 .08	46.3 0.7	57.83 0.14	78.2 3.6	44.82 .05	39.3 3.1	46.25 .08	39.7 3.1
Aug. 8.5	29.31 .01	29.6 2.7	40.61 .04	45.6 0.4	57.69 0.35	81.8 3.5	44.87 .00	42.4 2.9	46.33 .02	42.8 2.9
18.5	29.30 .05	32.3 2.4	40.65 .01	45.2 0.3	57.34 0.55	85.3 3.3	44.87 .05	45.3 2.7	46.35 .03	45.7 2.8
28.5	29.25 .10	34.7 2.1	40.64 .04	44.9 0.1	56.79 0.73	88.6 3.2	44.82 .11	48.0 2.5	46.32 .08	48.5 2.5
Sept. 7.4	29.15 .13	36.8 1.9	40.60 .09	44.8 0.0	56.06 0.90	91.8 2.9	44.71 .14	50.5 2.1	46.24 .12	51.0 2.2
17.4	29.02 .17	38.7 1.4	40.51 .11	44.8 0.2	55.16 1.05	94.7 2.6	44.57 .19	52.6 1.8	46.12 .15	53.2 1.9
27.4	28.85 .19	40.1 1.1	40.40 .14	45.0 0.3	54.11 1.18	97.3 2.1	44.38 .21	54.4 1.4	45.97 .19	55.1 1.5
Oct. 7.3	28.66 .21	41.2 0.7	40.26 .15	45.3 0.4	52.93 1.27	99.4 1.7	44.17 .23	55.8 1.0	45.78 .20	56.6 1.1
17.3	28.45 .21	41.9 0.3	40.11 .16	45.7 0.5	51.66 1.34	101.1 1.2	43.94 .24	56.8 0.5	45.58 .21	57.7 0.6
27.3	28.24 .22	42.2 0.2	39.95 .15	46.2 0.5	50.32 1.38	102.3 0.7	43.70 .24	57.3 0.1	45.37 .22	58.3 0.2
Nov. 6.3	28.02 .20	42.0 0.6	39.80 .14	46.7 0.5	48.94 1.38	103.0 0.1	43.46 .23	57.4 0.5	45.15 .21	58.5 0.3
16.2	27.82 .18	41.4 1.0	39.66 .12	47.2 0.6	47.56 1.35	103.1 0.5	43.23 .22	56.9 0.9	44.94 .20	58.2 0.7
26.2	27.64 .16	40.4 1.5	39.54 .10	47.8 0.6	46.21 1.28	102.6 1.0	43.01 .19	56.0 1.4	44.74 .17	57.5 1.2
Dec. 6.2	27.48 .13	38.9 1.8	39.44 .07	48.4 0.6	44.93 1.16	101.6 1.7	42.82 .17	54.6 1.8	44.57 .15	56.3 1.6
16.1	27.35 .09	37.1 2.2	39.37 .03	49.0 0.6	43.77 1.02	99.9 2.1	42.65 .13	52.8 2.2	44.42 .12	54.7 2.0
26.1	27.26 .05	34.9 2.4	39.34 .01	49.6 0.6	42.75 0.85	97.8 2.6	42.52 .08	50.6 2.5	44.30 .08	52.7 2.3
36.1	27.21	32.5	39.33	50.2	41.90	95.2	42.44	48.1	44.22	50.4

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Cygni.			τ Cygni.			α Cephei.			ι Pegasi.			ζ Capricorni.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.	
	h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
	21 8	+29 50		21 11	+37 38		21 16	+62 11		21 17	+19 24		21 21	-22 48	
Jan. 1.1	56.86			2.90			19.57			45.35			19.39		
11.1	56.81	.05	47.0	2.83	.07	59.4	19.34	.23	39.2	45.31	.04	23.2	19.37	.02	59.3
21.1	56.80	.01	44.7	2.80	.03	57.0	19.19	.15	36.4	45.30	.01	23.2	19.39	.02	59.1
31.0	56.82	.02	42.3	2.81	.01	54.3	19.11	.08	33.4	45.33	.03	21.2	19.39	.06	58.7
Feb. 10.0	56.89	.07	39.9	2.86	.05	51.6	19.12	.01	30.1	45.39	.06	19.3	19.45	.08	58.2
		.10	37.5		.10	48.9		.08	26.8		.10	17.4	19.53	.12	57.6
			2.3			2.5			3.2						.8
20.0	56.99		35.2	2.96		46.4	19.20		23.6	45.49		15.7	19.65		56.8
Mar. 2.0	57.13	.14	33.2	3.10	.14	44.1	19.37	.17	20.5	45.62	.13	14.2	19.80	.15	55.9
11.9	57.31	.18	31.6	3.28	.18	42.1	19.62	.25	17.7	45.78	.16	13.0	19.98	.18	54.8
21.9	57.52	.21	30.3	3.50	.22	40.5	19.94	.38	15.4	45.98	.20	12.2	20.19	.24	53.6
31.9	57.76	.27	29.5	3.76	.29	39.4	20.32	.44	13.6	46.21	.25	11.7	20.43	.27	52.2
			0.4			0.6			1.3						1.4
Apr. 10.8	58.03	.30	29.1	4.05	.32	38.8	20.76	.48	12.3	46.46	.27	11.7	20.70	.29	50.8
20.8	58.33	.31	29.3	4.37	.33	38.8	21.24	.50	11.6	46.73	.29	12.1	20.99	.31	49.3
30.8	58.64	.32	30.0	4.70	.34	39.3	21.74	.52	11.5	47.03	.30	13.0	21.30	.32	47.8
May 10.8	58.96	.32	31.1	5.04	.34	40.4	22.26	.51	12.1	47.33	.31	14.2	21.62	.33	46.2
20.7	59.28	.32	32.7	5.38	.34	41.9	22.77	.49	13.3	47.64	.31	15.8	21.95	.33	44.7
			2.0			2.0			1.7						1.4
30.7	59.60	.30	34.7	5.72	.32	43.9	23.26	.46	15.0	47.95	.29	17.7	22.28	.32	43.3
June 9.7	59.90	.28	36.9	6.04	.30	46.2	23.72	.42	17.2	48.24	.26	19.9	22.60	.31	42.1
19.7	60.18	.25	39.5	6.34	.26	48.8	24.14	.36	19.8	48.52	.25	22.2	22.91	.28	41.0
29.6	60.43	.22	42.2	6.60	.22	51.7	24.50	.30	22.8	48.77	.22	24.6	23.19	.25	40.1
July 9.6	60.65	.17	45.0	6.82	.18	54.7	24.80	.22	26.1	48.99	.18	27.1	23.44	.22	39.4
			2.9			3.1			3.4						0.4
19.6	60.82	.13	47.9	7.00	.13	57.8	25.02	.14	29.5	49.17	.14	29.6	23.66	.17	39.0
29.5	60.95	.08	50.7	7.13	.07	60.9	25.16	.06	33.0	49.31	.10	32.0	23.83	.13	38.8
Aug. 8.5	61.03	.03	53.4	7.20	.03	63.9	25.22	.02	36.6	49.41	.05	34.3	23.96	.08	38.9
18.5	61.06	.02	56.0	7.23	.03	66.8	25.20	.10	40.1	49.46	.00	36.4	24.04	.03	39.1
28.5	61.04	.06	58.3	7.20	.08	69.5	25.10	.17	43.5	49.46	.04	38.3	24.07	.01	39.6
			2.1			2.5			3.2						0.6
Sept. 7.4	60.98	.10	60.4	7.12	.11	72.0	24.93	.24	46.7	49.42	.07	40.0	24.06	.06	40.2
17.4	60.88	.14	62.3	7.01	.15	74.1	24.69	.30	49.6	49.35	.11	41.4	24.00	.10	41.0
27.4	60.74	.16	63.8	6.86	.19	76.0	24.39	.35	52.2	49.24	.14	42.5	23.90	.12	41.8
Oct. 7.4	60.58	.18	65.0	6.67	.20	77.5	24.04	.39	54.4	49.10	.15	43.3	23.78	.15	42.6
17.3	60.40	.19	65.8	6.47	.22	78.5	23.65	.42	56.1	48.95	.16	43.8	23.63	.15	43.4
			0.4			0.6			1.3						0.8
27.3	60.21	.20	66.2	6.25	.22	79.1	23.23	.44	57.4	48.79	.17	44.0	23.48	.16	44.2
Nov. 6.3	60.01	.18	66.2	6.03	.22	79.3	22.79	.44	58.1	48.62	.16	43.9	23.32	.15	44.9
16.2	59.83	.18	65.7	5.81	.20	79.0	22.35	.42	58.3	48.46	.15	43.5	23.17	.14	45.5
26.2	59.65	.16	64.9	5.61	.18	78.3	21.93	.40	57.9	48.31	.14	42.7	23.03	.12	46.0
Dec. 6.2	59.49	.13	63.7	5.43	.16	77.1	21.53	.37	56.9	48.17	.11	41.7	22.91	.10	46.3
			1.5			1.6			1.5						0.1
16.2	59.36	.10	62.2	5.27	.13	75.5	21.16	.32	55.4	48.06	.08	40.4	22.81	.06	46.4
26.1	59.26	.07	60.3	5.14	.09	73.5	20.84	.27	53.3	47.98	.06	38.8	22.75	.03	46.4
36.1	59.19		58.2	5.05		71.2	20.57		50.8	47.92		37.1	22.72		46.3



# FIXED STARS, 1907.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Aquarii.		$\beta$ Cephei ( <i>pr.</i> ).		$\xi$ Aquarii.		74 Cygni.		$\lambda^1$ Octantis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 21 26	° ' - 5 58	h m 21 27	° ' +70 8	h m 21 32	° ' - 8 16	h m 21 33	° ' +39 59	h m 21 36	° ' -83 8
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 1.1	37.91	54.2	25.50	80.0	46.20	22.3	11.56	50.4	30.58	65.5
11.1	37.89	54.9	25.12	77.4	46.18	22.8	11.46	48.1	29.84	62.6
21.1	37.90	55.5	24.84	74.4	46.18	23.3	11.40	45.5	29.40	59.3
31.0	37.94	56.0	24.66	71.2	46.22	23.7	11.38	42.8	29.27	55.9
Feb. 10.0	38.01	56.4	24.60	67.8	46.28	23.9	11.40	40.1	29.44	52.3
	20.0	38.11	56.6	64.5	46.37	24.0	11.47	37.4	29.91	48.7
Mar. 2.0	38.24	56.6	24.83	61.3	46.50	23.9	11.59	34.9	30.66	45.2
11.9	38.40	56.5	25.12	58.3	46.66	23.6	11.75	32.8	31.68	41.8
21.9	38.59	56.1	25.51	55.8	46.84	23.0	11.95	31.1	32.94	38.6
31.9	38.81	55.4	25.99	53.7	47.06	22.3	12.19	29.8	34.42	35.7
Apr. 10.9	39.05	54.5	26.55	52.1	47.30	21.3	12.47	29.0	36.08	33.2
20.8	39.32	53.4	27.17	51.1	47.56	20.1	12.78	28.7	37.89	31.0
30.8	39.60	52.1	27.83	50.8	47.85	18.7	13.12	28.9	39.82	29.3
May 10.8	39.90	50.6	28.50	51.1	48.15	17.2	13.47	29.7	41.82	28.0
20.7	40.21	49.0	29.17	52.0	48.46	15.6	13.82	31.0	43.86	27.3
	30.7	40.51	47.3	53.4	48.77	13.9	14.17	32.8	45.89	27.0
June 9.7	40.81	45.6	30.43	55.4	49.07	12.2	14.51	35.0	47.86	27.2
19.7	41.10	43.9	30.98	57.9	49.36	10.6	14.82	37.5	49.73	28.0
29.6	41.36	42.3	31.45	60.7	49.63	9.1	15.11	40.3	51.45	29.3
July 9.6	41.60	40.8	31.84	63.9	49.87	7.7	15.36	43.3	52.98	31.0
	19.6	41.80	39.5	67.3	50.08	6.4	15.56	46.4	54.28	33.2
29.6	41.96	38.4	32.32	70.9	50.25	5.4	15.72	49.6	55.31	35.7
Aug. 8.5	42.08	37.4	32.40	74.5	50.38	4.6	15.82	52.7	56.03	38.4
18.5	42.16	36.7	32.37	78.1	50.46	3.9	15.87	55.7	56.43	41.3
28.5	42.19	36.1	32.24	81.7	50.50	3.5	15.87	58.6	56.50	44.3
Sept. 7.4	42.17	35.8	32.00	85.1	50.49	3.3	15.82	61.2	56.23	47.3
17.4	42.12	35.7	31.67	88.2	50.44	3.3	15.72	63.6	55.63	50.2
27.4	42.03	35.7	31.26	91.0	50.36	3.5	15.58	65.7	54.73	52.8
Oct. 7.4	41.92	35.9	30.78	93.5	50.26	3.8	15.41	67.4	53.56	55.0
17.3	41.79	36.2	30.24	95.6	50.13	4.2	15.21	68.7	52.18	56.8
	27.3	41.65	36.7	97.2	49.99	4.7	15.00	69.6	50.64	58.1
Nov. 6.3	41.51	37.2	29.03	98.2	49.85	5.2	14.78	70.0	49.00	58.8
16.3	41.37	37.8	28.40	98.6	49.71	5.8	14.55	70.0	47.33	58.9
26.2	41.24	38.4	27.78	98.5	49.58	6.4	14.34	69.5	45.70	58.4
Dec. 6.2	41.13	39.1	27.18	97.8	49.46	7.1	14.14	68.6	44.17	57.3
	16.2	41.04	39.8	96.5	49.37	7.7	13.96	67.2	42.81	55.5
26.1	40.97	40.5	26.12	94.7	49.31	8.3	13.80	65.4	41.66	53.3
36.1	40.94	41.2	25.68	92.3	49.27	8.9	13.68	63.2	40.76	50.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Pegasi.		ι Cephei.		π Cygni.		μ Capricorni.		ι6 Pegasi.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 21 39 s	° ' " + 9 26 s	h m 21 40 s	° ' " + 70 52 s	h m 21 43 s	° ' " + 48 52 s	h m 21 48 s	° ' " - 13 59 s	h m 21 48 s	° ' " + 25 29 s
Jan. 1.1	35.35	53.4	31.46	71.0	19.71	53.2	11.67	30.5	48.17	18.0
11.1	35.31 <sup>-.04</sup>	52.1 <sup>1.3</sup>	31.04 <sup>-.42</sup>	68.5 <sup>2.5</sup>	19.56 <sup>-.15</sup>	50.8 <sup>2.4</sup>	11.64 <sup>-.03</sup>	30.7 <sup>0.2</sup>	48.10 <sup>-.07</sup>	16.2 <sup>1.8</sup>
21.1	35.29 <sup>-.02</sup>	50.7 <sup>1.4</sup>	30.72 <sup>-.32</sup>	65.6 <sup>2.9</sup>	19.45 <sup>-.11</sup>	48.1 <sup>2.7</sup>	11.63 <sup>-.01</sup>	30.9 <sup>0.2</sup>	48.05 <sup>-.01</sup>	14.2 <sup>2.0</sup>
31.1	35.31 <sup>-.02</sup>	49.4 <sup>1.3</sup>	30.50 <sup>-.22</sup>	62.5 <sup>3.1</sup>	19.39 <sup>-.06</sup>	45.2 <sup>2.9</sup>	11.65 <sup>-.02</sup>	30.9 <sup>0.0</sup>	48.04 <sup>-.01</sup>	12.1 <sup>2.1</sup>
Feb. 10.0	35.36 <sup>-.05</sup>	48.1 <sup>1.3</sup>	30.40 <sup>-.10</sup>	59.2 <sup>3.3</sup>	19.39 <sup>-.00</sup>	42.2 <sup>3.0</sup>	11.70 <sup>-.05</sup>	30.7 <sup>0.2</sup>	48.07 <sup>-.03</sup>	10.0 <sup>2.1</sup>
	35.36 <sup>-.08</sup>	48.1 <sup>1.1</sup>	30.40 <sup>-.01</sup>	59.2 <sup>3.3</sup>	19.39 <sup>-.04</sup>	42.2 <sup>2.9</sup>	11.70 <sup>-.09</sup>	30.7 <sup>0.3</sup>	48.07 <sup>-.06</sup>	10.0 <sup>2.0</sup>
20.0	35.44	47.0	30.41	55.9	19.43	39.3	11.79	30.4	48.13	8.0
Mar. 2.0	35.55 <sup>-.11</sup>	46.0 <sup>1.0</sup>	30.55 <sup>-.14</sup>	52.7 <sup>3.2</sup>	19.54 <sup>-.11</sup>	36.5 <sup>2.8</sup>	11.90 <sup>-.11</sup>	29.9 <sup>0.5</sup>	48.23 <sup>-.10</sup>	6.2 <sup>1.8</sup>
11.9	35.69 <sup>-.14</sup>	45.3 <sup>0.7</sup>	30.81 <sup>-.26</sup>	49.7 <sup>3.0</sup>	19.70 <sup>-.16</sup>	34.0 <sup>2.5</sup>	12.05 <sup>-.15</sup>	29.2 <sup>0.7</sup>	48.36 <sup>-.13</sup>	4.7 <sup>1.5</sup>
21.9	35.86 <sup>-.17</sup>	45.0 <sup>0.3</sup>	31.19 <sup>-.38</sup>	47.0 <sup>2.7</sup>	19.91 <sup>-.21</sup>	31.9 <sup>2.1</sup>	12.22 <sup>-.17</sup>	28.4 <sup>0.8</sup>	48.53 <sup>-.17</sup>	3.5 <sup>1.2</sup>
31.9	36.07 <sup>-.21</sup>	44.9 <sup>0.1</sup>	31.66 <sup>-.47</sup>	44.8 <sup>2.2</sup>	20.17 <sup>-.26</sup>	30.2 <sup>1.7</sup>	12.43 <sup>-.21</sup>	27.3 <sup>1.1</sup>	48.74 <sup>-.21</sup>	2.7 <sup>0.8</sup>
	36.07 <sup>-.23</sup>	44.9 <sup>0.3</sup>	31.66 <sup>-.55</sup>	44.8 <sup>1.7</sup>	20.17 <sup>-.31</sup>	30.2 <sup>1.2</sup>	12.43 <sup>-.24</sup>	27.3 <sup>1.3</sup>	48.74 <sup>-.24</sup>	2.7 <sup>0.4</sup>
Apr. 10.9	36.30	45.2	32.21	43.1	20.48	29.0	12.67	26.0	48.98	2.3
20.8	36.56 <sup>-.26</sup>	45.9 <sup>0.7</sup>	32.83 <sup>-.62</sup>	41.9 <sup>1.2</sup>	20.82 <sup>-.34</sup>	28.4 <sup>0.6</sup>	12.93 <sup>-.26</sup>	24.6 <sup>1.4</sup>	49.25 <sup>-.27</sup>	2.4 <sup>0.1</sup>
30.8	36.84 <sup>-.28</sup>	46.9 <sup>1.0</sup>	33.50 <sup>-.67</sup>	41.4 <sup>0.5</sup>	21.19 <sup>-.37</sup>	28.4 <sup>0.0</sup>	13.21 <sup>-.28</sup>	23.1 <sup>1.5</sup>	49.54 <sup>-.29</sup>	3.0 <sup>0.6</sup>
May 10.8	37.13 <sup>-.29</sup>	48.2 <sup>1.3</sup>	34.20 <sup>-.70</sup>	41.5 <sup>0.1</sup>	21.58 <sup>-.39</sup>	28.9 <sup>0.5</sup>	13.51 <sup>-.30</sup>	21.5 <sup>1.6</sup>	49.84 <sup>-.30</sup>	4.0 <sup>1.0</sup>
20.7	37.43 <sup>-.30</sup>	49.8 <sup>1.6</sup>	34.90 <sup>-.70</sup>	42.3 <sup>0.8</sup>	21.98 <sup>-.40</sup>	30.0 <sup>1.1</sup>	13.83 <sup>-.32</sup>	19.8 <sup>1.7</sup>	50.16 <sup>-.32</sup>	5.4 <sup>1.4</sup>
	37.43 <sup>-.31</sup>	49.8 <sup>1.8</sup>	34.90 <sup>-.68</sup>	42.3 <sup>1.3</sup>	21.98 <sup>-.39</sup>	30.0 <sup>1.6</sup>	13.83 <sup>-.31</sup>	19.8 <sup>1.7</sup>	50.16 <sup>-.32</sup>	5.4 <sup>1.7</sup>
30.7	37.74	51.6	35.58	43.6	22.37	31.6	14.14	18.1	50.48	7.1
June 9.7	38.04 <sup>-.30</sup>	53.6 <sup>2.0</sup>	36.22 <sup>-.64</sup>	45.4 <sup>1.8</sup>	22.75 <sup>-.38</sup>	33.7 <sup>2.1</sup>	14.46 <sup>-.32</sup>	16.5 <sup>1.6</sup>	50.79 <sup>-.31</sup>	9.2 <sup>2.1</sup>
19.7	38.32 <sup>-.28</sup>	55.7 <sup>2.1</sup>	36.81 <sup>-.59</sup>	47.7 <sup>2.3</sup>	23.10 <sup>-.35</sup>	36.2 <sup>2.5</sup>	14.76 <sup>-.29</sup>	15.0 <sup>1.5</sup>	51.09 <sup>-.30</sup>	11.6 <sup>2.4</sup>
29.6	38.59 <sup>-.27</sup>	57.8 <sup>2.1</sup>	37.33 <sup>-.52</sup>	50.5 <sup>2.8</sup>	23.42 <sup>-.32</sup>	39.0 <sup>2.8</sup>	15.05 <sup>-.29</sup>	13.6 <sup>1.4</sup>	51.37 <sup>-.28</sup>	14.1 <sup>2.5</sup>
July 9.6	38.83 <sup>-.24</sup>	60.0 <sup>2.2</sup>	37.76 <sup>-.43</sup>	53.6 <sup>3.1</sup>	23.70 <sup>-.28</sup>	42.0 <sup>3.0</sup>	15.31 <sup>-.26</sup>	12.4 <sup>1.2</sup>	51.62 <sup>-.25</sup>	16.7 <sup>2.6</sup>
	38.83 <sup>-.20</sup>	60.0 <sup>2.1</sup>	37.76 <sup>-.33</sup>	53.6 <sup>3.3</sup>	23.70 <sup>-.23</sup>	42.0 <sup>3.3</sup>	15.31 <sup>-.22</sup>	12.4 <sup>1.0</sup>	51.62 <sup>-.21</sup>	16.7 <sup>2.7</sup>
19.6	39.03	62.1	38.09	56.9	23.93	45.3	15.53	11.4	51.83	19.4
29.6	39.19 <sup>-.16</sup>	64.1 <sup>2.0</sup>	38.32 <sup>-.23</sup>	60.4 <sup>3.5</sup>	24.11 <sup>-.18</sup>	48.6 <sup>3.3</sup>	15.72 <sup>-.19</sup>	10.6 <sup>0.8</sup>	52.00 <sup>-.17</sup>	22.1 <sup>2.7</sup>
Aug. 8.5	39.31 <sup>-.12</sup>	65.9 <sup>1.8</sup>	38.44 <sup>-.12</sup>	64.1 <sup>3.7</sup>	24.22 <sup>-.11</sup>	52.0 <sup>3.4</sup>	15.87 <sup>-.15</sup>	10.0 <sup>0.6</sup>	52.12 <sup>-.12</sup>	24.7 <sup>2.6</sup>
18.5	39.39 <sup>-.08</sup>	67.5 <sup>1.6</sup>	38.45 <sup>-.01</sup>	67.7 <sup>3.6</sup>	24.28 <sup>-.06</sup>	55.3 <sup>3.3</sup>	15.97 <sup>-.10</sup>	9.7 <sup>0.3</sup>	52.20 <sup>-.08</sup>	27.2 <sup>2.5</sup>
28.5	39.43 <sup>-.04</sup>	69.0 <sup>1.5</sup>	38.35 <sup>-.10</sup>	71.3 <sup>3.6</sup>	24.27 <sup>-.01</sup>	58.5 <sup>3.2</sup>	16.02 <sup>-.05</sup>	9.6 <sup>0.1</sup>	52.23 <sup>-.03</sup>	29.4 <sup>2.2</sup>
	39.43 <sup>-.01</sup>	69.0 <sup>1.2</sup>	38.35 <sup>-.21</sup>	71.3 <sup>3.5</sup>	24.27 <sup>-.06</sup>	58.5 <sup>3.0</sup>	16.02 <sup>-.01</sup>	9.6 <sup>0.1</sup>	52.23 <sup>-.01</sup>	29.4 <sup>2.1</sup>
Sept. 7.5	39.42	70.2	38.14	74.8	24.21	61.5	16.03	9.7	52.22	31.5
17.4	39.37 <sup>-.05</sup>	71.2 <sup>1.0</sup>	37.84 <sup>-.30</sup>	78.0 <sup>3.2</sup>	24.10 <sup>-.11</sup>	64.2 <sup>2.7</sup>	16.00 <sup>-.03</sup>	10.0 <sup>0.3</sup>	52.17 <sup>-.05</sup>	33.4 <sup>1.9</sup>
27.4	39.29 <sup>-.08</sup>	71.9 <sup>0.7</sup>	37.45 <sup>-.39</sup>	81.0 <sup>3.0</sup>	23.94 <sup>-.16</sup>	66.7 <sup>2.5</sup>	15.93 <sup>-.07</sup>	10.5 <sup>0.5</sup>	52.08 <sup>-.09</sup>	34.9 <sup>1.5</sup>
Oct. 7.4	39.18 <sup>-.11</sup>	72.4 <sup>0.5</sup>	36.98 <sup>-.47</sup>	83.7 <sup>2.7</sup>	23.74 <sup>-.20</sup>	68.8 <sup>2.1</sup>	15.84 <sup>-.09</sup>	11.0 <sup>0.5</sup>	51.96 <sup>-.12</sup>	36.1 <sup>1.2</sup>
17.3	39.05 <sup>-.13</sup>	72.6 <sup>0.2</sup>	36.44 <sup>-.54</sup>	85.9 <sup>2.2</sup>	23.51 <sup>-.23</sup>	70.5 <sup>1.7</sup>	15.72 <sup>-.12</sup>	11.6 <sup>0.6</sup>	51.82 <sup>-.14</sup>	37.1 <sup>1.0</sup>
	39.05 <sup>-.14</sup>	72.6 <sup>0.0</sup>	36.44 <sup>-.59</sup>	85.9 <sup>1.8</sup>	23.51 <sup>-.25</sup>	70.5 <sup>1.2</sup>	15.72 <sup>-.14</sup>	11.6 <sup>0.7</sup>	51.82 <sup>-.16</sup>	37.1 <sup>0.5</sup>
27.3	38.91	72.6	35.85	87.7	23.26	71.7	15.58	12.3	51.66	37.6
Nov. 6.3	38.77 <sup>-.14</sup>	72.4 <sup>0.2</sup>	35.23 <sup>-.62</sup>	88.9 <sup>1.2</sup>	22.99 <sup>-.27</sup>	72.5 <sup>0.8</sup>	15.44 <sup>-.14</sup>	13.0 <sup>0.7</sup>	51.49 <sup>-.17</sup>	37.8 <sup>0.2</sup>
16.3	38.62 <sup>-.15</sup>	72.0 <sup>0.4</sup>	34.58 <sup>-.65</sup>	89.6 <sup>0.7</sup>	22.72 <sup>-.27</sup>	72.8 <sup>0.3</sup>	15.30 <sup>-.14</sup>	13.7 <sup>0.7</sup>	51.32 <sup>-.17</sup>	37.7 <sup>0.1</sup>
26.2	38.48 <sup>-.14</sup>	71.3 <sup>0.7</sup>	33.94 <sup>-.64</sup>	89.7 <sup>0.1</sup>	22.45 <sup>-.27</sup>	72.5 <sup>0.3</sup>	15.17 <sup>-.13</sup>	14.3 <sup>0.6</sup>	51.16 <sup>-.16</sup>	37.2 <sup>0.5</sup>
Dec. 6.2	38.36 <sup>-.12</sup>	70.5 <sup>0.8</sup>	33.31 <sup>-.63</sup>	89.2 <sup>0.5</sup>	22.20 <sup>-.25</sup>	71.7 <sup>0.8</sup>	15.05 <sup>-.12</sup>	14.8 <sup>0.5</sup>	51.01 <sup>-.15</sup>	36.3 <sup>0.9</sup>
	38.36 <sup>-.10</sup>	70.5 <sup>1.0</sup>	33.31 <sup>-.60</sup>	89.2 <sup>1.1</sup>	22.20 <sup>-.24</sup>	71.7 <sup>1.2</sup>	15.05 <sup>-.10</sup>	14.8 <sup>0.5</sup>	51.01 <sup>-.14</sup>	36.3 <sup>1.2</sup>
16.2	38.26	69.5	32.71	88.1	21.96	70.5	14.95	15.3	50.87	35.1
26.2	38.18 <sup>-.08</sup>	68.3 <sup>1.2</sup>	32.17 <sup>-.54</sup>	86.4 <sup>1.7</sup>	21.75 <sup>-.21</sup>	68.7 <sup>1.8</sup>	14.88 <sup>-.07</sup>	15.8 <sup>0.5</sup>	50.76 <sup>-.11</sup>	33.6 <sup>1.5</sup>
36.1	38.12 <sup>-.06</sup>	67.0 <sup>1.3</sup>	31.70 <sup>-.47</sup>	84.3 <sup>2.1</sup>	21.58 <sup>-.17</sup>	66.5 <sup>2.2</sup>	14.83 <sup>-.05</sup>	16.1 <sup>0.3</sup>	50.67 <sup>-.09</sup>	31.9 <sup>1.7</sup>

# FIXED STARS, 1907.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	79 Draconis.		α Aquarii.		α Gruis.		π <sup>3</sup> Pegasi.		θ Aquarii.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 21 51	° ' " +73 15	h m 22 0	° ' " - 0 46	h m 22 2	° ' " -47 24	h m 22 5	° ' " +32 43	h m 22 11	° ' " - 8 14
Jan. 1.1	39.77	56.4	58.75	22.5	19.85	57.2	49.84	23.1	53.87	53.8
11.1	39.25	54.0	58.70	23.3	19.76	55.9	49.74	21.1	53.82	54.4
21.1	38.83	51.3	58.68	24.1	19.71	54.2	49.67	19.0	53.79	54.8
31.1	38.54	48.3	58.68	24.9	19.71	52.3	49.63	16.7	53.78	55.1
Feb. 10.0	38.37	45.0	58.71	25.5	19.75	50.2	49.62	14.4	53.81	55.3
20.0	38.34	41.7	58.77	26.0	19.84	47.9	49.66	12.1	53.86	55.3
Mar. 2.0	38.46	38.4	58.86	26.3	19.97	45.5	49.73	9.9	53.95	55.1
12.0	38.71	35.3	58.99	26.4	20.15	43.0	49.85	8.1	54.07	54.7
21.9	39.09	32.6	59.15	26.2	20.38	40.5	50.01	6.5	54.22	54.1
31.9	39.59	30.2	59.33	25.7	20.64	38.0	50.21	5.3	54.40	53.2
Apr. 10.9	40.19	28.3	59.55	25.0	20.95	35.6	50.45	4.6	54.61	52.1
20.8	40.87	27.0	59.80	24.0	21.29	33.3	50.72	4.4	54.85	50.8
30.8	41.61	26.3	60.07	22.7	21.66	31.1	51.02	4.6	55.12	49.3
May 10.8	42.38	26.3	60.36	21.2	22.06	29.2	51.34	5.3	55.41	47.7
20.7	43.17	26.8	60.66	19.6	22.48	27.6	51.67	6.5	55.71	46.0
June 30.7	43.94	27.9	60.96	17.8	22.91	26.2	52.01	8.1	56.02	44.2
9.7	44.67	29.6	61.27	15.9	23.33	25.2	52.34	10.1	56.33	42.4
19.7	45.34	31.8	61.57	14.0	23.75	24.6	52.66	12.4	56.64	40.6
29.6	45.94	34.4	61.85	12.2	24.14	24.4	52.96	15.0	56.93	39.0
July 9.6	46.45	37.4	62.10	10.4	24.50	24.6	53.22	17.7	57.20	37.4
19.6	46.84	40.7	62.32	8.7	24.82	25.1	53.45	20.6	57.44	36.0
29.6	47.13	44.2	62.51	7.2	25.09	26.0	53.64	23.5	57.64	34.9
Aug. 8.5	47.29	47.8	62.66	5.9	25.31	27.3	53.78	26.4	57.80	34.0
18.5	47.33	51.5	62.76	4.8	25.46	28.8	53.88	29.2	57.92	33.3
28.5	47.24	55.1	62.82	3.9	25.55	30.6	53.92	31.8	57.99	32.8
Sept. 7.5	47.04	58.6	62.84	3.2	25.58	32.5	53.92	34.3	58.02	32.5
17.4	46.73	62.0	62.82	2.7	25.54	34.4	53.88	36.5	58.01	32.5
27.4	46.31	65.1	62.76	2.5	25.45	36.4	53.80	38.5	57.97	32.6
Oct. 7.4	45.79	67.9	62.67	2.4	25.31	38.3	53.68	40.1	57.89	32.9
17.4	45.20	70.3	62.56	2.6	25.13	40.0	53.53	41.4	57.79	33.4
Nov. 27.3	44.55	72.3	62.44	2.8	24.93	41.5	53.37	42.4	57.67	33.9
6.3	43.84	73.7	62.30	3.2	24.71	42.7	53.19	42.9	57.54	34.5
16.3	43.11	74.6	62.17	3.8	24.48	43.5	53.01	43.0	57.41	35.2
26.2	42.37	75.0	62.04	4.4	24.26	43.9	52.83	42.8	57.28	35.8
Dec. 6.2	41.64	74.7	61.92	5.1	24.06	43.9	52.65	42.1	57.16	36.5
16.2	40.94	73.8	61.82	5.9	23.88	43.6	52.49	41.0	57.05	37.2
26.2	40.29	72.3	61.73	6.8	23.73	42.8	52.35	39.6	56.96	37.8
36.1	39.71	70.3	61.67	7.6	23.62	41.7	52.24	37.8	56.90	38.3

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Octantis.		γ Aquarii.		π Aquarii.		σ Aquarii.		α Lacertæ.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 22 13	° ' " -86 26	h m 22 16	° ' " - 1 51	h m 22 20	° ' " + 0 54	h m 22 25	° ' " -11 8	h m 22 27	° ' " +49 47
Jan. 1.2	42.25	46.8	49.53	26.5	30.03	14.8	41.90	82.0	26.11	84.1
11.1	40.22	44.0	49.47	27.3	29.97	14.0	41.84	82.4	25.92	82.2
21.1	38.71	40.9	49.44	28.1	29.93	13.1	41.80	82.7	25.76	79.8
31.1	37.75	37.5	49.43	28.7	29.91	12.3	41.79	82.9	25.64	77.2
Feb. 10.0	37.36	33.9	49.44	29.3	29.93	11.6	41.80	82.8	25.57	74.4
20.0	37.55	30.2	49.49	29.7	29.97	11.1	41.84	82.6	25.55	71.6
Mar. 2.0	38.30	26.4	49.57	29.9	30.04	10.7	41.91	82.2	25.59	68.8
12.0	39.58	22.8	49.68	29.8	30.14	10.6	42.02	81.6	25.69	66.2
21.9	41.37	19.3	49.82	29.5	30.28	10.7	42.15	80.8	25.85	63.9
31.9	43.62	16.0	49.99	29.0	30.45	11.1	42.32	79.8	26.06	61.9
Apr. 10.9	46.28	13.0	50.20	28.2	30.66	11.8	42.53	78.5	26.33	60.4
20.9	49.28	10.4	50.44	27.2	30.89	12.7	42.76	77.1	26.64	59.4
30.8	52.58	8.1	50.70	25.9	31.15	13.9	43.02	75.5	26.99	58.9
May 10.8	56.10	6.4	50.98	24.4	31.43	15.4	43.31	73.8	27.37	59.0
20.8	59.77	5.1	51.28	22.7	31.73	17.0	43.61	72.0	27.77	59.7
30.7	63.51	4.4	51.59	20.9	32.03	18.8	43.92	70.2	28.18	60.8
June 9.7	67.23	4.2	51.90	19.0	32.34	20.7	44.24	68.4	28.59	62.5
19.7	70.85	4.5	52.20	17.1	32.64	22.7	44.55	66.6	28.98	64.6
29.7	74.27	5.4	52.49	15.2	32.93	24.6	44.85	65.0	29.34	67.1
July 9.6	77.41	6.8	52.75	13.4	33.20	26.5	45.13	63.5	29.67	69.9
19.6	80.18	8.6	52.99	11.8	33.43	28.3	45.38	62.2	29.96	73.0
29.6	82.51	10.9	53.19	10.3	33.63	29.9	45.59	61.1	30.20	76.2
Aug. 8.6	84.31	13.5	53.35	9.0	33.80	31.4	45.76	60.3	30.38	79.6
18.5	85.54	16.3	53.47	7.9	33.92	32.7	45.90	59.7	30.50	82.9
28.5	86.14	19.3	53.55	7.0	34.00	33.7	45.99	59.4	30.57	86.2
Sept. 7.5	86.10	22.4	53.58	6.4	34.03	34.5	46.03	59.3	30.58	89.4
17.4	85.42	25.5	53.57	6.0	34.03	35.1	46.04	59.4	30.53	92.4
27.4	84.12	28.3	53.53	5.8	33.99	35.4	46.00	59.7	30.43	95.2
Oct. 7.4	82.25	30.9	53.46	5.7	33.92	35.6	45.94	60.2	30.29	97.7
17.4	79.88	33.1	53.36	5.9	33.82	35.5	45.85	60.8	30.11	99.8
27.3	77.10	34.8	53.24	6.2	33.71	35.3	45.73	61.4	29.89	101.5
Nov. 6.3	74.03	35.9	53.12	6.6	33.59	35.0	45.61	62.1	29.65	102.8
16.3	70.78	36.5	52.99	7.2	33.46	34.5	45.48	62.9	29.40	103.6
26.3	67.48	36.4	52.86	7.8	33.33	33.9	45.35	63.6	29.14	103.9
Dec. 6.2	64.27	35.6	52.74	8.5	33.21	33.2	45.22	64.2	28.88	103.6
16.2	61.26	34.3	52.63	9.3	33.10	32.4	45.11	64.8	28.63	102.9
26.2	58.56	32.4	52.54	10.1	33.01	31.5	45.02	65.4	28.39	101.6
36.1	56.27	29.9	52.47	10.8	32.94	30.7	44.95	65.9	28.18	99.9

# FIXED STARS, 1907.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♈ Aquarii.		226 Cephei (B.).		10 Lacertæ.		β Octantis.		ζ Pegasi.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 22 30	° ' s — 0 35	h m 22 30	° ' s +75 44	h m 22 35	° ' s +38 33	h m 22 36	° ' s —81 51	h m 22 36	° ' s +10 20
	s	"	s	"	s	"	s	"	s	"
Jan. 1.2	33.09	53.9 0.8	36.72	63.0 1.9	3.86	64.2 1.8	26.51	90.7 2.4	47.94	42.8 1.1
11.1	33.02	54.7 0.8	36.01	61.1 2.3	3.71	62.4 2.1	25.55	88.3 2.8	47.86	41.7 1.2
21.1	32.97	55.5 0.7	35.40	58.8 2.7	3.60	60.3 2.3	24.80	85.5 3.2	47.80	40.5 1.3
31.1	32.95	56.2 0.6	34.92	56.1 3.0	3.52	58.0 2.4	24.26	82.3 3.5	47.77	39.2 1.2
Feb. 10.1	32.95	56.8 0.4	34.57	53.1 3.2	3.47	55.6 2.4	23.96	78.8 3.6	47.76	38.0 1.0
20.0	32.99	57.2 0.3	34.37	49.9 3.3	3.46	53.2 2.3	23.91	75.2 3.7	47.78	37.0 0.9
Mar. 2.0	33.05	57.5 0.0	34.34	46.6 3.2	3.50	50.9 2.2	24.09	71.5 3.7	47.83	36.1 0.7
12.0	33.14	57.5 0.2	34.48	43.4 3.0	3.58	48.7 1.9	24.51	67.8 3.6	47.91	35.4 0.4
21.9	33.27	57.3 0.5	34.78	40.4 2.7	3.72	46.8 1.6	25.16	64.2 3.5	48.03	35.0 0.1
31.9	33.43	56.8 0.7	35.23	37.7 2.2	3.90	45.2 1.1	26.02	60.7 3.2	48.19	34.9 0.2
Apr. 10.9	33.63	56.1 1.0	35.82	35.5 1.8	4.12	44.1 0.6	27.07	57.5 2.9	48.38	35.1 0.5
20.9	33.86	55.1 1.3	36.52	33.7 1.2	4.38	43.5 0.2	28.30	54.6 2.5	48.61	35.6 0.9
30.8	34.11	53.8 1.5	37.32	32.5 0.6	4.68	43.3 0.4	29.68	52.1 2.1	48.86	36.5 1.2
May 10.8	34.39	52.3 1.7	38.18	31.9 0.0	5.00	43.7 0.8	31.18	50.0 1.7	49.14	37.7 1.5
20.8	34.69	50.6 1.8	39.08	31.9 0.6	5.35	44.5 1.3	32.78	48.3 1.2	49.43	39.2 1.7
30.8	34.99	48.8 1.9	39.99	32.5 1.2	5.71	45.8 1.8	34.44	47.1 0.6	49.74	40.9 1.9
June 9.7	35.30	46.9 2.0	40.88	33.7 1.7	6.06	47.6 2.1	36.11	46.5 0.1	50.05	42.8 2.1
19.7	35.61	44.9 1.9	41.72	35.4 2.2	6.41	49.7 2.5	37.77	46.4 0.4	50.36	44.9 2.1
29.7	35.90	43.0 1.9	42.49	37.6 2.6	6.74	52.2 2.7	39.37	46.8 1.0	50.65	47.0 2.2
July 9.6	36.17	41.1 1.7	43.18	40.2 3.0	7.04	54.9 2.9	40.87	47.8 1.5	50.92	49.2 2.2
19.6	36.41	39.4 1.6	43.76	43.2 3.3	7.31	57.8 3.0	42.22	49.3 1.9	51.17	51.4 2.1
29.6	36.62	37.8 1.4	44.22	46.5 3.5	7.53	60.8 3.0	43.39	51.2 2.3	51.38	53.5 1.9
Aug. 8.6	36.79	36.4 1.2	44.55	50.0 3.7	7.71	63.8 3.0	44.35	53.5 2.7	51.55	55.4 1.8
18.5	36.92	35.2 0.9	44.74	53.7 3.7	7.84	66.8 2.9	45.06	56.2 2.9	51.69	57.2 1.6
28.5	37.01	34.3 0.7	44.80	57.4 3.7	7.92	69.7 2.8	45.50	59.1 3.0	51.78	58.8 1.4
Sept. 7.5	37.06	33.6 0.5	44.72	61.1 3.6	7.95	72.5 2.6	45.65	62.1 3.0	51.83	60.2 1.1
17.5	37.07	33.1 0.3	44.50	64.7 3.5	7.94	75.1 2.4	45.53	65.1 3.0	51.84	61.3 0.9
27.4	37.04	32.8 0.1	44.15	68.2 3.2	7.88	77.5 2.0	45.12	68.1 2.7	51.81	62.2 0.7
Oct. 7.4	36.98	32.7 0.1	43.68	71.4 2.8	7.78	79.5 1.7	44.45	70.8 2.4	51.75	62.9 0.4
17.4	36.89	32.8 0.3	43.11	74.2 2.5	7.65	81.2 1.4	43.54	73.2 2.0	51.66	63.3 0.2
27.3	36.78	33.1 0.4	42.44	76.7 2.1	7.49	82.6 1.0	42.44	75.2 1.5	51.55	63.5 0.0
Nov. 6.3	36.66	33.5 0.5	41.70	78.8 1.5	7.32	83.6 0.6	41.19	76.7 0.9	51.43	63.5 0.2
16.3	36.54	34.0 0.6	40.90	80.3 0.9	7.13	84.2 0.1	39.84	77.6 0.3	51.30	63.3 0.5
26.3	36.41	34.6 0.7	40.06	81.2 0.4	6.93	84.3 0.3	38.45	77.9 1.0	51.17	62.8 0.7
Dec. 6.2	36.29	35.3 0.8	39.20	81.6 0.3	6.74	84.0 0.8	37.07	77.6 1.3	51.05	62.1 0.8
16.2	36.18	36.1 0.8	38.35	81.3 0.9	6.55	83.2 1.2	35.74	76.6 1.5	50.93	61.3 0.9
26.2	36.09	36.9 0.8	37.53	80.4 1.4	6.38	82.0 1.6	34.53	75.1 2.1	50.83	60.4 1.1
36.2	36.01	37.7	36.77	79.0	6.23	80.4	33.47	73.0	50.74	59.3

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\lambda$ Pegasi.		$\epsilon$ Cephei.		$\lambda$ Aquarii.		$\alpha$ Piscis Australis. (Fomalhaut.)		$\alpha$ Andromedæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m	° '	h m	° '	h m	° '	h m	° '	h m	° '
	22 42	+23 4	22 46	+65 42	22 47	- 8 4	22 52	-30 6	22 57	+41 49
Jan. 1.2	1.64	36.1	20.68	52.3	44.24	36.3	29.01	69.3	37.16	41.0
11.1	1.54	34.6	20.28	50.5	44.16	36.8	28.91	69.0	36.99	39.4
21.1	1.46	33.0	19.94	48.3	44.10	37.2	28.84	68.4	36.84	37.4
31.1	1.40	31.2	19.66	45.7	44.07	37.5	28.79	67.5	36.72	35.2
Feb. 10.1	1.37	29.4	19.45	42.8	44.06	37.6	28.78	66.4	36.64	32.8
20.0	1.38	27.7	19.33	39.7	44.07	37.6	28.79	65.1	36.60	30.4
Mar. 2.0	1.42	26.1	19.31	36.6	44.12	37.3	28.84	63.5	36.61	27.9
12.0	1.50	24.7	19.38	33.5	44.20	36.9	28.93	61.7	36.67	25.6
22.0	1.62	23.6	19.55	30.6	44.32	36.2	29.05	59.8	36.77	23.5
31.9	1.77	22.8	19.81	28.1	44.47	35.3	29.21	57.7	36.93	21.8
Apr. 10.9	1.97	22.3	20.16	26.0	44.65	34.2	29.41	55.5	37.14	20.4
20.9	2.20	22.3	20.58	24.3	44.87	32.8	29.65	53.3	37.39	19.5
30.8	2.46	22.7	21.06	23.2	45.11	31.2	29.92	51.0	37.69	19.1
May 10.8	2.74	23.5	21.60	22.6	45.39	29.5	30.22	48.8	38.02	19.2
20.8	3.05	24.7	22.17	22.6	45.68	27.7	30.54	46.7	38.37	19.7
30.8	3.37	26.2	22.76	23.3	45.98	25.8	30.88	44.8	38.73	20.8
June 9.7	3.69	28.1	23.34	24.5	46.30	23.9	31.23	43.0	39.10	22.3
19.7	4.01	30.2	23.90	26.2	46.61	22.0	31.58	41.5	39.47	24.2
29.7	4.32	32.5	24.43	28.4	46.91	20.2	31.92	40.2	39.82	26.5
July 9.7	4.60	34.9	24.91	31.0	47.20	18.6	32.25	39.3	40.15	29.1
19.6	4.85	37.5	25.33	34.0	47.46	17.1	32.55	38.7	40.44	31.9
29.6	5.07	40.0	25.68	37.2	47.69	15.8	32.81	38.4	40.70	34.9
Aug. 8.6	5.25	42.5	25.95	40.6	47.88	14.8	33.03	38.5	40.91	38.0
18.5	5.38	44.9	26.14	44.2	48.03	14.0	33.21	38.9	41.07	41.1
28.5	5.48	47.2	26.24	47.9	48.14	13.4	33.35	39.6	41.18	44.1
Sept. 7.5	5.52	49.2	26.26	51.5	48.20	13.1	33.43	40.6	41.24	47.1
17.5	5.53	51.1	26.19	55.0	48.23	13.0	33.46	41.8	41.25	49.9
27.4	5.50	52.7	26.05	58.3	48.22	13.1	33.45	43.2	41.22	52.5
Oct. 7.4	5.43	54.1	25.83	61.4	48.17	13.4	33.40	44.6	41.14	54.8
17.4	5.34	55.1	25.55	64.2	48.10	13.9	33.31	46.1	41.02	56.8
27.4	5.22	55.9	25.21	66.6	48.00	14.5	33.20	47.5	40.88	58.4
Nov. 6.3	5.09	56.4	24.82	68.6	47.89	15.1	33.06	48.8	40.71	59.7
16.3	4.95	56.5	24.40	70.0	47.77	15.8	32.92	49.9	40.53	60.6
26.3	4.80	56.3	23.95	70.9	47.64	16.5	32.77	50.8	40.33	61.0
Dec. 6.2	4.66	55.8	23.48	71.3	47.52	17.2	32.62	51.5	40.13	60.9
16.2	4.52	55.0	23.02	71.1	47.41	17.9	32.48	51.9	39.93	60.4
26.2	4.39	54.0	22.57	70.2	47.31	18.6	32.36	52.1	39.74	59.5
36.2	4.28	52.6	22.15	68.8	47.22	19.1	32.25	51.9	39.56	58.1

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Pegasi. (Markab.)		$\phi$ Aquarii.		$\epsilon$ Cephei.		$\tau$ Pegasi.		$\theta$ Piscium.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 23 0	° ' " +14 42	h m 23 9	° ' " - 6 32	h m 23 14	° ' " +67 35	h m 23 16	° ' " +23 13	h m 23 23	° ' " + 5 51
	s	"	s	"	s	"	s	"	s	"
Jan. 1.2	6.32	16.5	28.95	69.6	47.11	82.0	0.74	53.9	13.75	61.1
	.10	1.2	.09	0.6	.47	1.4	.12	1.3	.10	.09
11.2	6.22	15.3	28.86	70.2	46.64	80.6	0.62	52.6	13.65	60.2
	.08	1.3	.07	0.5	.42	1.9	.10	1.4	.09	.09
21.1	6.14	14.0	28.79	70.7	46.22	78.7	0.52	51.2	13.56	59.3
	.06	1.4	.06	0.3	.35	2.3	.08	1.5	.07	.09
31.1	6.08	12.6	28.73	71.0	45.87	76.4	0.44	49.7	13.49	58.4
	.03	1.3	.03	0.2	.29	2.7	.06	1.7	.05	.08
Feb. 10.1	6.05	11.3	28.70	71.2	45.58	73.7	0.38	48.0	13.44	57.6
	.01	1.2	.00	0.1	.20	2.9	.03	1.6	.02	.07
20.1	6.04	10.1	28.70	71.3	45.38	70.8	0.35	46.4	13.42	56.9
	.03	1.1	.02	0.2	.10	3.1	.00	1.5	.00	.05
Mar. 2.0	6.07	9.0	28.72	71.1	45.28	67.7	0.35	44.9	13.42	56.4
	.06	0.9	.06	0.4	.00	3.1	.04	1.4	.04	.04
12.0	6.13	8.1	28.78	70.7	45.28	64.6	0.39	43.5	13.46	56.0
	.10	0.7	.09	0.6	.11	2.9	.08	1.2	.08	.02
22.0	6.23	7.4	28.87	70.1	45.39	61.7	0.47	42.3	13.54	55.8
	.13	0.4	.13	0.8	.21	2.7	.12	0.9	.11	.02
31.9	6.36	7.0	29.00	69.3	45.60	59.0	0.59	41.4	13.65	56.0
	.17	0.1	.16	1.1	.32	2.4	.17	0.5	.15	.04
Apr. 10.9	6.53	6.9	29.16	68.2	45.92	56.6	0.76	40.9	13.80	56.4
	.21	0.3	.20	1.3	.40	2.0	.20	0.1	.19	.07
20.9	6.74	7.2	29.36	66.9	46.32	54.6	0.96	40.8	13.99	57.1
	.24	0.7	.23	1.5	.48	1.4	.24	0.2	.22	1.0
30.9	6.98	7.9	29.59	65.4	46.80	53.2	1.20	41.0	14.21	58.1
	.27	1.0	.26	1.7	.55	0.9	.27	0.7	.25	1.3
May 10.8	7.25	8.9	29.85	63.7	47.35	52.3	1.47	41.7	14.46	59.4
	.29	1.3	.29	1.9	.59	0.4	.30	1.0	.28	1.5
20.8	7.54	10.2	30.14	61.8	47.94	51.9	1.77	42.7	14.74	60.9
	.31	1.6	.30	1.9	.62	0.3	.31	1.3	.29	1.7
30.8	7.85	11.8	30.44	59.9	48.56	52.2	2.08	44.0	15.03	62.6
	.32	1.9	.31	2.0	.63	0.8	.33	1.7	.31	1.9
June 9.7	8.17	13.7	30.75	57.9	49.19	53.0	2.41	45.7	15.34	64.5
	.31	2.0	.31	1.9	.62	1.3	.32	2.0	.31	2.0
19.7	8.48	15.7	31.06	56.0	49.81	54.3	2.73	47.9	15.65	66.5
	.30	2.2	.31	1.9	.59	1.9	.32	2.2	.31	2.1
29.7	8.78	17.9	31.37	54.1	50.40	56.2	3.05	49.7	15.96	68.6
	.29	2.3	.29	1.7	.55	2.3	.30	2.3	.29	2.0
July 9.7	9.07	20.2	31.66	52.4	50.95	58.5	3.35	52.2	16.25	70.6
	.26	2.2	.27	1.6	.50	2.7	.27	2.5	.27	2.0
19.6	9.33	22.4	31.93	50.8	51.45	61.2	3.62	54.7	16.52	72.6
	.23	2.3	.24	1.4	.43	3.1	.25	2.4	.25	1.9
29.6	9.56	24.7	32.17	49.4	51.88	64.3	3.87	57.1	16.77	74.5
	.20	2.1	.21	1.2	.36	3.3	.21	2.5	.21	1.8
Aug. 8.6	9.76	26.8	32.38	48.2	52.24	67.6	4.08	59.6	16.98	76.3
	.15	2.0	.17	1.0	.27	3.5	.17	2.4	.18	1.6
18.6	9.91	28.8	32.55	47.2	52.51	71.1	4.25	62.0	17.16	77.9
	.11	1.9	.13	0.7	.18	3.6	.13	2.3	.14	1.4
28.5	10.02	30.7	32.68	46.5	52.69	74.7	4.38	64.3	17.30	79.3
	.07	1.6	.09	0.4	.10	3.7	.09	2.1	.09	1.2
Sept. 7.5	10.09	32.3	32.77	46.1	52.79	78.4	4.47	66.4	17.39	80.5
	.03	1.5	.05	0.1	.01	3.6	.04	1.9	.06	0.9
17.5	10.12	33.8	32.82	46.0	52.80	82.0	4.51	68.3	17.45	81.4
	.00	1.2	.00	0.0	.08	3.5	.01	1.7	.02	0.7
27.5	10.12	35.0	32.82	46.0	52.72	85.5	4.52	70.0	17.47	82.1
	.04	0.9	.02	0.2	.16	3.3	.03	1.5	.02	0.5
Oct. 7.4	10.08	35.9	32.80	46.2	52.56	88.8	4.49	71.5	17.45	82.6
	.07	0.7	.06	0.4	.24	3.1	.06	1.2	.04	0.3
17.4	10.01	36.6	32.74	46.6	52.32	91.9	4.43	72.7	17.41	82.9
	.09	0.5	.08	0.6	.31	2.7	.09	0.9	.07	0.1
27.4	9.92	37.1	32.66	47.2	52.01	94.6	4.34	73.6	17.34	83.0
	.11	0.2	.10	0.6	.37	2.3	.11	0.6	.09	.02
Nov. 6.3	9.81	37.3	32.56	47.8	51.64	96.9	4.23	74.2	17.25	82.8
	.12	0.0	.11	0.7	.41	1.9	.12	0.3	.10	.03
16.3	9.69	37.3	32.45	48.5	51.23	98.8	4.11	74.5	17.15	82.5
	.13	0.3	.11	0.8	.46	1.3	.13	0.0	.11	.04
26.3	9.56	37.0	32.34	49.3	50.77	100.1	3.98	74.5	17.04	82.1
	.13	0.5	.12	0.7	.48	0.8	.14	0.2	.12	.06
Dec. 6.3	9.43	36.5	32.22	50.0	50.29	100.9	3.84	74.3	16.92	81.5
	.12	0.8	.11	0.7	.50	0.2	.14	0.6	.11	.07
16.2	9.31	35.7	32.11	50.7	49.79	101.1	3.70	73.7	16.81	80.8
	.12	0.9	.11	0.7	.50	0.4	.13	0.9	.11	.08
26.2	9.19	34.8	32.00	51.4	49.29	100.7	3.57	72.8	16.70	80.0
	.11	1.1	.09	0.6	.48	0.9	.12	1.1	.11	.08
36.2	9.08	33.7	31.91	52.0	48.81	99.8	3.45	71.7	16.59	79.2

# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Andromedæ.			ι Piscium.			γ Cephei.			β Aquarii.		
	Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination South.	
	h m 23 32	° ' s +45 57		h m 23 35	° ' s + 5 7		h m 23 35	° ' s +77 6		h m 23 39	° ' s -18 47	
Jan. 1.2	59.58	23.5	8.79	15.2	30.79	61.8	21.39	48.3				
	59.37	22.2	8.69	14.3	29.90	60.9	21.28	48.6				
	59.18	20.5	8.60	13.5	29.07	59.4	21.18	48.6				
	59.02	18.5	8.52	12.6	28.34	57.3	21.10	48.4				
Feb. 10.1	58.88	16.2	8.46	11.9	27.72	54.8	21.04	48.0				
	58.79	13.8	8.43	11.2	27.25	52.0	21.01	47.3				
Mar. 2.0	58.74	11.3	8.43	10.7	26.94	49.0	21.01	46.4				
	58.75	8.9	8.46	10.4	26.82	45.8	21.03	45.2				
	58.81	6.6	8.52	10.3	26.87	42.7	21.10	43.8				
Apr. 1.0	58.93	4.6	8.62	10.4	27.11	39.7	21.20	42.2				
	59.11	2.9	8.76	10.9	27.53	37.0	21.34	40.4				
	59.34	1.6	8.93	11.6	28.11	34.6	21.51	38.5				
	59.62	0.7	9.15	12.6	28.82	32.7	21.73	36.4				
May 10.9	59.94	0.3	9.39	13.9	29.65	31.3	21.98	34.3				
	60.29	0.5	9.66	15.4	30.57	30.5	22.25	32.1				
	60.67	1.1	9.96	17.1	31.55	30.3	22.55	29.9				
June 9.8	61.06	2.2	10.27	19.0	32.56	30.6	22.87	27.8				
	61.46	3.8	10.58	21.0	33.56	31.5	23.20	25.9				
	61.85	5.7	10.89	23.0	34.54	32.9	23.52	24.1				
July 9.7	62.21	8.1	11.19	25.0	35.45	34.9	23.84	22.5				
	62.55	10.7	11.47	27.0	36.29	37.3	24.14	21.2				
	62.86	13.5	11.72	28.9	37.03	40.1	24.41	20.2				
Aug. 8.6	63.12	16.5	11.94	30.7	37.65	43.3	24.65	19.5				
	63.33	19.6	12.13	32.2	38.14	46.7	24.85	19.1				
	63.50	22.7	12.28	33.6	38.50	50.3	25.02	19.0				
	63.61	25.8	12.39	34.7	38.72	54.0	25.14	19.2				
Sept. 7.5	63.67	28.8	12.46	35.6	38.79	57.8	25.22	19.7				
	63.68	31.6	12.49	36.3	38.71	61.5	25.26	20.5				
	63.65	34.2	12.49	36.7	38.49	65.1	25.26	21.4				
Oct. 7.4	63.57	36.6	12.46	36.9	38.13	68.5	25.23	22.5				
	63.46	38.6	12.40	36.9	37.65	71.7	25.17	23.7				
Nov. 6.4	63.31	40.3	12.32	36.8	37.05	74.5	25.08	24.8				
	63.14	41.6	12.23	36.5	36.34	76.9	24.98	25.9				
	62.95	42.5	12.12	36.0	35.55	78.7	24.86	27.0				
Dec. 6.3	62.74	42.9	12.01	35.4	34.69	80.0	24.74	27.9				
	62.53	42.8	11.90	34.7	33.78	80.8	24.62	28.7				
	62.31	42.3	11.79	34.0	32.86	80.9	24.50	29.3				
	62.10	41.3	11.68	33.1	31.94	80.4	24.39	29.6				



# FIXED STARS, 1907.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♄ Sculptoris.			γ <sup>1</sup> Octantis.			Groombridge 4163.			♆ Piscium.		
	Right Ascension.		Declination South.	Right Ascension.		Declination South.	Right Ascension.		Declination North.	Right Ascension.		Declination North.
	h	m	°	h	m	°	h	m	°	h	m	°
	23	44	28 38	23	46	82 31	23	50	73 53	23	54	6 20
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 1.2	3.52		57.5	33.96		93.6	17.17		47.4	31.03		49.9
11.2	3.39	.13	57.5	32.56	1.40	92.0	16.47	.70	46.6	30.92	.11	49.1
21.2	3.28	.11	57.2	31.30	1.26	89.8	15.80	.67	45.2	30.82	.10	48.2
31.1	3.19	.09	56.5	30.22	1.08	87.2	15.20	.60	43.3	30.73	.09	47.4
Feb. 10.1	3.12	.07	55.6	29.35	0.87	84.1	14.69	.51	41.0	30.65	.08	46.6
		.05			0.64			.41			.05	
20.1	3.07		54.4	28.71		80.7	14.28		38.3	30.60		45.9
Mar. 2.1	3.06	.01	52.9	28.31	0.40	77.1	14.00	.28	35.4	30.58	.02	45.4
12.0	3.08	.02	51.2	28.16	0.15	73.3	13.86	.14	32.3	30.59	.01	45.0
22.0	3.14	.06	49.2	28.27	0.11	69.5	13.87	.01	29.2	30.63	.04	44.9
Apr. 1.0	3.24	.10	47.1	28.63	0.36	65.7	14.03	.16	26.2	30.71	.08	45.0
		.14			0.60			.30			.12	
11.0	3.38		44.8	29.23		61.9	14.33		23.5	30.83		45.4
20.9	3.56	.18	42.5	30.07	0.84	58.4	14.76	.43	21.2	30.99	.16	46.0
30.9	3.78	.22	40.0	31.12	1.05	55.2	15.32	.56	19.2	31.19	.20	46.9
May 10.9	4.04	.26	37.6	32.37	1.25	52.3	15.98	.66	17.7	31.42	.23	48.1
20.8	4.33	.29	35.2	33.80	1.43	49.7	16.72	.74	16.8	31.68	.26	49.6
		.32			1.56			.79			.29	
30.8	4.65		32.8	35.36		47.6	17.51		16.5	31.97		51.3
June 9.8	4.98	.33	30.7	37.03	1.67	46.0	18.34	.83	16.7	32.27	.30	53.1
19.8	5.32	.34	28.8	38.76	1.73	45.0	19.17	.83	17.5	32.58	.31	55.1
29.7	5.67	.35	27.1	40.52	1.76	44.5	19.99	.82	18.8	32.90	.32	57.1
July 9.7	6.00	.33	25.7	42.25	1.73	44.5	20.77	.78	20.6	33.20	.30	59.2
		.32			1.66			.73			.29	
19.7	6.32		24.7	43.91		45.1	21.50		22.9	33.49		61.2
29.6	6.62	.30	24.1	45.45	1.54	46.3	22.15	.65	25.6	33.75	.26	63.1
Aug. 8.6	6.88	.26	23.8	46.83	1.38	48.0	22.71	.56	28.6	33.99	.24	64.9
18.6	7.10	.22	23.9	47.99	1.16	50.2	23.18	.47	31.9	34.19	.20	66.5
28.6	7.28	.18	24.3	48.91	0.92	52.7	23.53	.35	35.5	34.36	.17	68.0
		.14			0.64			.24			.12	
Sept. 7.5	7.42		25.1	49.55		55.5	23.77		39.2	34.48		69.2
17.5	7.51	.09	26.2	49.89	0.34	58.5	23.90	.13	42.9	34.57	.09	70.2
27.5	7.55	.04	27.5	49.93	0.04	61.6	23.91	.01	46.6	34.62	.05	71.0
Oct. 7.5	7.55	.00	29.0	49.65	0.28	64.7	23.80	.11	50.2	34.64	.02	71.5
17.4	7.52	.03	30.5	49.08	0.57	67.6	23.58	.22	53.6	34.63	.01	71.8
		.07			0.85			.32			.04	
27.4	7.45		32.1	48.23		70.2	23.26		56.8	34.59		71.9
Nov. 6.4	7.35	.10	33.7	47.14	1.09	72.4	22.84	.42	59.6	34.52	.07	71.8
16.4	7.24	.11	35.1	45.86	1.28	74.2	22.33	.51	62.1	34.44	.08	71.6
26.3	7.11	.13	36.4	44.43	1.43	75.4	21.75	.58	64.0	34.35	.09	71.2
Dec. 6.3	6.97	.14	37.4	42.91	1.52	76.0	21.10	.65	65.5	34.24	.11	70.7
		.14			1.56			.69			.11	
16.3	6.83		38.1	41.35		76.0	20.41		66.3	34.13		70.0
26.2	6.69	.14	38.6	39.82	1.53	75.4	19.70	.71	66.6	34.02	.11	69.3
36.2	6.56	.13	38.8	38.36	1.46	74.1	18.98	.72	66.2	33.91	.11	68.5

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	"	m s	h m s
Jan. 1	18 44 11.89	12.52	-23 3 39.1	38.5	11.044	+ 11.66	+ 3 24.30	16 17.88	1 11.07	18 40 47.67
2	18 48 36.79	37.51	22 58 45.4	44.6	11.030	12.81	3 52.62	16 17.89	1 11.03	18 44 44.23
3	18 53 1.34	2.14	22 53 24.1	23.1	11.016	13.95	4 20.63	16 17.89	1 10.99	18 48 40.79
4	18 57 25.55	26.44	22 47 35.8	34.3	11.001	15.08	4 48.29	16 17.89	1 10.94	18 52 37.34
5	19 1 49.37	50.34	22 41 20.1	18.6	10.984	16.21	5 15.56	16 17.87	1 10.88	18 56 33.90
6	19 6 12.80	13.85	-22 34 37.4	35.7	10.966	+ 17.33	+ 5 42.44	16 17.84	1 10.82	19 0 30.46
7	19 10 35.79	36.92	22 27 28.2	26.2	10.948	18.45	6 8.88	16 17.81	1 10.75	19 4 27.02
8	19 14 58.32	59.53	22 19 52.2	50.0	10.929	19.55	6 34.86	16 17.78	1 10.68	19 8 23.57
9	19 19 20.37	21.66	22 11 49.7	47.2	10.908	20.64	7 0.36	16 17.74	1 10.61	19 12 20.13
10	19 23 41.91	43.26	22 3 21.3	18.6	10.886	21.73	7 25.34	16 17.70	1 10.54	19 16 16.69
11	19 28 2.91	4.32	-21 54 26.8	23.8	10.863	+ 22.81	+ 7 49.80	16 17.66	1 10.46	19 20 13.24
12	19 32 23.35	24.83	21 45 6.9	3.6	10.839	23.87	8 13.68	16 17.61	1 10.38	19 24 9.80
13	19 36 43.20	44.75	21 35 21.6	18.0	10.813	24.92	8 36.98	16 17.56	1 10.30	19 28 6.36
14	19 41 2.42	4.04	21 25 11.3	7.4	10.787	25.95	8 59.65	16 17.50	1 10.21	19 32 2.91
15	19 45 21.01	22.69	21 14 36.1	31.8	10.760	26.98	9 21.68	16 17.44	1 10.12	19 35 59.47
16	19 49 38.91	40.66	-21 3 36.5	31.9	10.732	+ 27.98	+ 9 43.03	16 17.37	1 10.03	19 39 56.03
17	19 53 56.12	57.92	20 52 12.7	7.7	10.703	28.98	10 3.69	16 17.30	1 9.94	19 43 52.58
18	19 58 12.63	14.49	20 40 25.1	19.8	10.672	29.96	10 23.63	16 17.23	1 9.84	19 47 49.14
19	20 2 28.39	30.29	20 28 14.0	8.4	10.641	30.94	10 42.83	16 17.15	1 9.74	19 51 45.70
20	20 6 43.39	45.36	20 15 39.8	33.9	10.609	31.89	11 1.28	16 17.07	1 9.64	19 55 42.25
21	20 10 57.62	59.64	-20 2 42.7	36.4	10.577	+ 32.84	+ 11 17.95	16 16.99	1 9.54	19 59 38.81
22	20 15 11.09	13.15	19 49 23.2	16.6	10.545	33.77	11 35.85	16 16.90	1 9.43	20 3 35.37
23	20 19 23.78	25.86	19 35 41.6	34.7	10.512	34.68	11 51.99	16 16.81	1 9.33	20 7 31.92
24	20 23 35.66	37.78	19 21 38.3	31.1	10.479	35.57	12 7.30	16 16.71	1 9.22	20 11 28.48
25	20 27 46.74	48.90	19 7 13.5	5.8	10.445	36.46	12 21.82	16 16.61	1 9.11	20 15 25.04
26	20 31 57.02	59.21	-18 52 27.9	19.9	10.411	+ 37.32	+ 12 35.55	16 16.49	1 9.00	20 19 21.59
27	20 36 6.49	8.71	18 37 21.6	13.3	10.378	38.18	12 48.45	16 16.37	1 8.89	20 23 18.15
28	20 40 15.15	17.40	18 21 55.0	46.4	10.344	39.02	13 0.55	16 16.25	1 8.78	20 27 14.70
29	20 44 22.96	25.24	18 5 68.7	59.8	10.311	39.83	13 11.80	16 16.12	1 8.66	20 31 11.26
30	20 48 29.98	32.28	17 49 62.9	53.7	10.276	40.64	13 22.26	16 15.98	1 8.54	20 35 7.82
31	20 52 36.19	38.50	-17 33 37.9	28.4	10.243	+ 41.42	+ 13 31.91	16 15.84	1 8.42	20 39 4.37
Feb. 1	20 56 41.59	43.92	17 16 54.3	44.5	10.208	42.19	13 40.74	16 15.69	1 8.31	20 43 0.93
2	21 0 46.16	48.50	16 59 52.4	42.3	10.174	42.96	13 48.76	16 15.54	1 8.19	20 46 57.48
3	21 4 49.94	52.29	16 42 32.5	22.2	10.140	43.70	13 55.96	16 15.39	1 8.08	20 50 54.04
4	21 8 52.91	55.27	16 24 55.1	44.6	10.107	44.42	14 2.38	16 15.23	1 7.97	20 54 50.59
5	21 12 55.09	57.46	-16 6 60.7	50.0	10.074	+ 45.13	+ 14 8.00	16 15.06	1 7.85	20 58 47.14
6	21 16 56.47	58.85	15 48 49.6	38.6	10.041	45.81	14 12.82	16 14.89	1 7.73	21 2 43.70
7	21 20 57.07	59.45	15 30 22.3	17.1	10.008	46.48	14 16.85	16 14.72	1 7.61	21 6 40.26
8	21 24 56.89	59.27	15 11 38.9	27.5	9.976	47.13	14 20.11	16 14.54	1 7.50	21 10 36.81
9	21 28 55.92	58.30	14 52 40.2	28.6	9.943	47.76	14 22.58	16 14.36	1 7.39	21 14 33.36
10	21 32 54.18	56.56	-14 33 26.3	14.5	9.911	+ 48.38	+ 14 24.27	16 14.18	1 7.28	21 18 29.92
11	21 36 51.66	54.04	14 13 57.8	45.9	9.879	48.97	14 25.19	16 13.99	1 7.17	21 22 26.47
12	21 40 48.37	50.74	13 54 15.1	3.0	9.847	49.55	14 25.34	16 13.80	1 7.06	21 26 23.03
13	21 44 44.31	46.67	13 34 18.7	6.6	9.814	50.11	14 24.72	16 13.61	1 6.95	21 30 19.58
14	21 48 39.51	41.86	13 13 68.9	56.7	9.783	50.65	14 23.35	16 13.42	1 6.84	21 34 16.14
15	21 52 33.93	36.27	-12 53 46.3	34.0	9.752	+ 51.18	+ 14 21.21	16 13.23	1 6.74	21 38 12.69
16	21 56 27.62	29.93	-12 32 71.4	59.0	9.722	+ 51.69	+ 14 18.35	16 13.04	1 6.64	21 42 9.24

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0<sup>s</sup>.19 from the sidereal interval.

[Eph 07]

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	"	m s	h m s
Feb. 16	21 56 27.62	29.93	- 12 32 71.4	59.0	9.722	+ 51.69	+ 14 18.33	16 13.04	1 6.64	21 42 9.24
17	22 0 20.56	22.85	12 12 24.1	11.6	9.692	52.18	14 14.72	16 12.84	1 6.54	21 46 5.80
18	22 4 12.77	15.04	11 51 25.3	12.8	9.662	52.66	14 10.38	16 12.64	1 6.44	21 50 2.35
19	22 8 4.28	6.53	11 30 15.3	2.7	9.632	53.13	14 5.32	16 12.44	1 6.34	21 53 58.91
20	22 11 55.08	57.31	11 8 54.6	42.0	9.603	53.57	13 59.57	16 12.23	1 6.24	21 57 55.46
21	22 15 45.19	47.40	- 10 47 23.5	10.9	9.574	+ 53.99	+ 13 53.12	16 12.02	1 6.14	22 1 52.01
22	22 19 34.64	36.83	10 25 42.4	29.9	9.546	54.39	13 46.00	16 11.80	1 6.05	22 5 48.57
23	22 23 23.44	25.60	10 3 51.9	39.4	9.519	54.78	13 38.24	16 11.58	1 5.96	22 9 45.12
24	22 27 11.59	13.72	9 41 52.4	39.9	9.493	55.16	13 29.83	16 11.36	1 5.87	22 13 41.67
25	22 30 59.13	61.23	9 19 44.0	31.5	9.468	55.51	13 20.82	16 11.13	1 5.78	22 17 38.23
26	22 34 46.08	48.15	- 8 57 27.3	14.9	9.444	+ 55.86	+ 13 11.21	16 10.90	1 5.69	22 21 34.78
27	22 38 32.44	34.48	8 34 62.6	50.3	9.420	56.19	13 1.02	16 10.67	1 5.61	22 25 31.33
28	22 42 18.25	20.26	8 12 30.4	18.2	9.397	56.49	12 50.27	16 10.43	1 5.53	22 29 27.88
Mar. 1	22 46 3.51	5.49	7 49 51.0	38.9	9.376	56.78	12 38.97	16 10.19	1 5.45	22 33 24.44
2	22 49 48.26	50.20	7 26 64.9	52.9	9.355	57.06	12 26.77	16 9.95	1 5.38	22 37 20.99
3	22 53 32.53	34.43	- 7 4 12.3	0.5	9.335	+ 57.32	+ 12 14.88	16 9.70	1 5.31	22 41 17.54
4	22 57 16.32	18.19	6 41 13.8	2.2	9.317	57.57	12 2.11	16 9.44	1 5.24	22 45 14.10
5	23 0 59.65	61.48	6 17 69.4	58.1	9.298	57.79	11 48.89	16 9.18	1 5.18	22 49 10.65
6	23 4 42.56	44.36	5 54 60.0	48.9	9.281	58.00	11 35.24	16 8.92	1 5.12	22 53 7.20
7	23 8 25.07	26.83	5 31 45.5	34.5	9.264	58.20	11 21.21	16 8.66	1 5.06	22 57 3.75
8	23 12 7.18	8.90	- 5 8 26.6	15.8	9.248	+ 58.38	+ 11 6.77	16 8.40	1 5.00	23 1 0.30
9	23 15 48.92	50.59	4 44 63.4	52.8	9.232	58.54	10 51.95	16 8.14	1 4.94	23 4 56.86
10	23 19 30.32	31.95	4 21 36.4	26.0	9.217	58.69	10 36.79	16 7.88	1 4.88	23 8 53.41
11	23 23 11.38	12.97	3 57 66.2	56.1	9.203	58.81	10 21.30	16 7.61	1 4.83	23 12 49.96
12	23 26 52.12	53.67	3 34 32.9	23.0	9.190	58.92	10 5.49	16 7.35	1 4.78	23 16 46.52
13	23 30 32.56	34.06	- 3 10 56.9	47.3	9.178	+ 59.02	+ 9 49.38	16 7.08	1 4.73	23 20 43.07
14	23 34 12.71	14.17	2 47 18.9	9.5	9.167	59.12	9 32.98	16 6.82	1 4.69	23 24 39.62
15	23 37 52.59	54.00	2 23 38.9	29.8	9.156	59.19	9 16.31	16 6.55	1 4.65	23 28 36.17
16	23 41 32.21	33.57	1 59 57.6	48.8	9.146	59.24	8 59.38	16 6.29	1 4.61	23 32 32.72
17	23 45 11.60	12.92	1 36 15.4	6.9	9.136	59.27	8 42.22	16 6.02	1 4.58	23 36 29.28
18	23 48 50.77	52.05	- 1 12 32.5	24.3	9.126	+ 59.29	+ 8 24.84	16 5.76	1 4.56	23 40 25.83
19	23 52 29.73	30.97	0 48 49.4	41.5	9.119	59.29	8 7.25	16 5.49	1 4.54	23 44 22.38
20	23 56 8.52	9.71	0 24 66.3	58.7	9.112	59.28	7 49.49	16 5.23	1 4.52	23 48 18.93
21	23 59 47.15	48.29	- 0 1 23.7	16.4	9.106	59.25	7 31.56	16 4.96	1 4.50	23 52 15.49
22	0 3 25.63	26.73	+ 0 22 18.1	25.1	9.101	59.21	7 13.50	16 4.69	1 4.48	23 56 12.04
23	0 7 3.99	5.04	+ 0 45 58.4	65.1	9.096	+ 59.15	+ 6 55.31	16 4.42	1 4.46	0 0 8.59
24	0 10 42.26	43.27	1 9 37.2	43.6	9.093	59.07	6 37.03	16 4.15	1 4.45	0 4 5.14
25	0 14 20.44	21.41	1 33 14.1	20.2	9.091	58.99	6 18.66	16 3.88	1 4.44	0 8 1.70
26	0 17 58.57	59.49	1 56 48.7	54.5	9.090	58.88	6 0.24	16 3.61	1 4.43	0 11 58.25
27	0 21 36.67	37.53	2 20 20.6	26.1	9.090	58.76	5 41.79	16 3.33	1 4.43	0 15 54.80
28	0 25 14.75	15.56	+ 2 43 49.5	54.6	9.090	+ 58.64	+ 5 23.32	16 3.06	1 4.43	0 19 51.35
29	0 28 52.84	53.60	3 7 15.0	19.8	9.090	58.50	5 4.88	16 2.78	1 4.44	0 23 47.90
30	0 32 30.97	31.69	3 30 36.9	41.4	9.092	58.33	4 46.45	16 2.50	1 4.44	0 27 44.46
31	0 36 9.16	9.83	3 53 54.9	59.1	9.094	58.16	4 28.09	16 2.22	1 4.45	0 31 41.01
Apr. 1	0 39 47.42	48.05	4 17 8.5	12.3	9.097	57.97	4 9.81	16 1.94	1 4.46	0 35 37.56
2	0 43 25.81	26.39	+ 4 40 17.5	21.1	9.102	+ 57.78	+ 3 51.64	16 1.66	1 4.48	0 39 34.12
3	0 47 4.33	4.87	+ 5 3 21.5	24.8	9.108	+ 57.56	+ 3 33.61	16 1.37	1 4.50	0 43 30.67

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

## SOLAR EPHEMERIS, 1907.

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.	
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.					
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s	
Apr.	1	0 39 47.42	48.05	+ 4 17 8.5	12.3	9.097	+ 57.97	+ 4 9.81	16 1.94	1 4.46	0 35 37.56
	2	0 43 25.81	26.39	4 40 17.5	21.1	9.102	57.78	3 51.64	16 1.66	1 4.48	0 39 34.12
	3	0 47 4.33	4.87	5 3 21.5	24.8	9.108	57.56	3 33.61	16 1.37	1 4.50	0 43 30.67
	4	0 50 42.99	43.48	5 26 20.2	23.2	9.115	57.34	3 15.73	16 1.09	1 4.52	0 47 27.22
	5	0 54 21.84	22.28	5 49 13.4	16.1	9.123	57.10	2 58.03	16 0.81	1 4.55	0 51 23.77
	6	0 58 0.86	1.26	+ 6 12 0.6	3.0	9.131	+ 56.84	+ 2 40.50	16 0.53	1 4.58	0 55 20.32
	7	1 1 40.09	40.45	6 34 41.5	43.7	9.140	56.57	2 23.18	16 0.25	1 4.61	0 59 16.88
	8	1 5 19.54	19.86	6 57 15.8	17.7	9.149	56.29	2 6.08	15 59.97	1 4.64	1 3 13.43
	9	1 8 59.25	59.53	7 19 43.1	44.8	9.158	55.99	1 49.25	15 59.69	1 4.68	1 7 9.98
	10	1 12 39.18	39.41	7 42 3.1	4.5	9.169	55.67	1 32.63	15 59.41	1 4.72	1 11 6.54
	11	1 16 19.40	19.59	+ 8 4 15.3	16.3	9.181	+ 55.34	+ 1 16.30	15 59.14	1 4.76	1 15 3.09
	12	1 19 59.90	60.05	8 26 19.4	20.2	9.193	54.99	1 0.25	15 58.87	1 4.80	1 18 59.64
	13	1 23 40.70	40.81	8 48 15.1	15.7	9.205	54.63	0 44.49	15 58.60	1 4.84	1 22 56.20
	14	1 27 21.81	21.88	9 10 2.0	2.3	9.218	54.26	0 29.05	15 58.33	1 4.89	1 26 52.75
	15	1 31 3.23	3.26	9 31 39.8	39.9	9.231	53.87	+ 0 13.92	15 58.06	1 4.94	1 30 49.30
	16	1 34 45.00	45.00	+ 9 53 8.1	8.0	9.245	+ 53.46	- 0 0.85	15 57.80	1 4.99	1 34 45.85
	17	1 38 27.09	27.05	10 14 26.6	26.3	9.260	53.04	0 15.32	15 57.53	1 5.04	1 38 42.41
	18	1 42 9.55	9.48	10 35 34.9	34.4	9.275	52.61	0 29.42	15 57.27	1 5.09	1 42 38.96
	19	1 45 52.37	52.26	10 56 32.6	31.9	9.291	52.17	0 43.14	15 57.02	1 5.15	1 46 35.51
	20	1 49 35.58	35.44	11 17 19.4	18.5	9.308	51.71	0 56.48	15 56.76	1 5.21	1 50 32.07
	21	1 53 19.21	19.03	+ 11 37 55.0	53.9	9.325	+ 51.24	- 1 9.41	15 56.51	1 5.27	1 54 28.62
	22	1 57 3.23	3.02	11 58 19.2	18.0	9.342	50.75	1 21.93	15 56.26	1 5.34	1 58 25.17
	23	2 0 47.67	47.42	12 18 31.4	30.0	9.360	50.25	1 34.03	15 56.01	1 5.40	2 2 21.73
	24	2 4 32.57	32.29	12 38 31.4	29.9	9.378	49.74	1 45.69	15 55.76	1 5.47	2 6 18.28
	25	2 8 17.91	17.60	12 58 18.8	17.2	9.397	49.21	1 56.91	15 55.51	1 5.53	2 10 14.84
	26	2 12 3.72	3.38	+ 13 17 53.3	51.6	9.417	+ 48.67	- 2 7.66	15 55.26	1 5.60	2 14 11.39
	27	2 15 50.01	49.65	13 37 14.8	12.9	9.438	48.12	2 17.92	15 55.01	1 5.67	2 18 7.94
	28	2 19 36.79	36.41	13 56 22.8	20.9	9.459	47.55	2 27.70	15 54.77	1 5.75	2 22 4.50
	29	2 23 24.08	23.67	14 15 17.0	15.0	9.481	46.97	2 36.96	15 54.52	1 5.83	2 26 1.05
	30	2 27 11.89	11.46	14 33 57.2	55.1	9.503	46.38	2 45.70	15 54.28	1 5.90	2 29 57.61
May	1	2 30 60.24	59.78	+ 14 52 23.0	20.9	9.525	+ 45.77	- 2 53.90	15 54.03	1 5.98	2 33 54.16
	2	2 34 49.13	48.64	15 10 34.2	31.9	9.548	45.15	3 1.57	15 53.79	1 6.06	2 37 50.72
	3	2 38 38.59	38.10	15 28 30.5	28.1	9.572	44.51	3 8.67	15 53.54	1 6.14	2 41 47.27
	4	2 42 28.62	28.09	15 46 11.4	9.0	9.595	43.87	3 15.18	15 53.30	1 6.22	2 45 43.82
	5	2 46 19.22	18.67	16 3 37.0	34.6	9.619	43.22	3 21.14	15 53.06	1 6.30	2 49 40.38
	6	2 50 10.39	9.82	+ 16 20 46.6	44.1	9.643	+ 42.55	- 3 26.52	15 52.83	1 6.38	2 53 36.93
	7	2 54 2.15	1.58	16 37 40.1	37.6	9.668	41.87	3 31.33	15 52.60	1 6.46	2 57 33.49
	8	2 57 54.48	53.90	16 54 17.0	14.5	9.692	41.19	3 35.55	15 52.38	1 6.54	3 1 30.04
	9	3 1 47.39	46.80	17 10 37.3	34.8	9.716	40.49	3 39.20	15 52.16	1 6.62	3 5 26.60
	10	3 5 40.90	40.30	17 26 40.3	37.9	9.741	39.76	3 42.24	15 51.94	1 6.70	3 9 23.15
	11	3 9 34.98	34.37	+ 17 42 26.0	23.6	9.765	+ 39.03	- 3 44.72	15 51.73	1 6.78	3 13 19.71
	12	3 13 29.64	29.02	17 57 54.0	51.6	9.789	38.29	3 46.63	15 51.52	1 6.87	3 17 16.27
	13	3 17 24.88	24.25	18 13 3.8	1.4	9.813	37.53	3 47.94	15 51.31	1 6.95	3 21 12.82
	14	3 21 20.68	20.05	18 27 55.2	52.9	9.837	36.75	3 48.70	15 51.10	1 7.03	3 25 9.38
	15	3 25 17.03	16.40	18 42 28.1	25.8	9.860	35.97	3 48.90	15 50.90	1 7.10	3 29 5.93
	16	3 29 13.95	13.32	+ 18 56 42.0	39.8	9.883	+ 35.19	- 3 48.54	15 50.70	1 7.18	3 33 2.49
	17	3 33 11.43	10.80	+ 19 10 36.6	34.4	9.906	+ 34.37	- 3 47.62	15 50.51	1 7.26	3 36 59.04

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

[Rph 07]

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	"	m s	h m s
May 17	3 33 11.43	10.80	+19 10 36.6	34.4	9.906	+34.37	-3 47.62	15 50.51	1 7.26	3 36 59.04
18	3 37 9.47	8.85	19 24 11.7	9.6	9.929	33.55	3 46.15	15 50.33	1 7.34	3 40 55.60
19	3 41 8.04	7.42	19 37 27.0	25.0	9.951	32.72	3 44.12	15 50.15	1 7.42	3 44 52.15
20	3 45 7.15	6.54	19 50 22.2	20.3	9.973	31.87	3 41.57	15 49.97	1 7.50	3 48 48.71
21	3 49 6.79	6.18	20 2 57.1	55.3	9.995	31.02	3 38.49	15 49.79	1 7.58	3 52 45.27
22	3 53 6.95	6.35	+20 15 11.6	9.8	10.017	+30.16	-3 34.88	15 49.62	1 7.66	3 56 41.82
23	3 57 7.64	7.05	20 27 5.2	3.5	10.039	29.29	3 30.75	15 49.45	1 7.74	4 0 38.38
24	4 1 8.83	8.26	20 38 37.7	36.1	10.060	28.41	3 26.12	15 49.28	1 7.81	4 4 34.94
25	4 5 10.53	9.97	20 49 48.9	47.4	10.081	27.53	3 20.98	15 49.11	1 7.88	4 8 31.49
26	4 9 12.71	12.16	21 0 38.5	37.1	10.102	26.63	3 15.36	15 48.95	1 7.95	4 12 28.05
27	4 13 15.38	14.85	+21 11 6.5	5.2	10.122	+25.72	-3 9.24	15 48.79	1 8.02	4 16 24.60
28	4 17 18.53	18.02	21 21 12.6	11.4	10.142	24.80	3 2.65	15 48.63	1 8.09	4 20 21.16
29	4 21 22.16	21.67	21 30 56.5	55.4	10.162	23.88	2 55.57	15 48.47	1 8.16	4 24 17.72
30	4 25 26.27	25.80	21 40 18.1	17.1	10.181	22.95	2 48.03	15 48.32	1 8.22	4 28 14.28
31	4 29 30.83	30.38	21 49 17.2	16.3	10.200	22.00	2 40.02	15 48.17	1 8.28	4 32 10.83
June 1	4 33 35.83	35.41	+21 57 53.6	52.7	10.219	+21.04	-2 31.56	15 48.03	1 8.34	4 36 7.39
2	4 37 41.27	40.87	22 6 7.2	6.4	10.237	20.08	2 22.68	15 47.88	1 8.40	4 40 3.94
3	4 41 47.12	46.75	22 13 57.7	57.0	10.253	19.12	2 13.39	15 47.74	1 8.46	4 44 0.50
4	4 45 53.37	53.02	22 21 25.2	24.6	10.269	18.15	2 3.70	15 47.60	1 8.51	4 47 57.06
5	4 49 60.01	59.69	22 28 29.3	28.8	10.285	17.18	1 53.62	15 47.47	1 8.56	4 51 53.62
6	4 54 7.00	6.71	+22 35 9.8	9.4	10.300	+16.20	-1 43.18	15 47.34	1 8.61	4 55 50.17
7	4 58 14.34	14.08	22 41 26.7	26.3	10.314	15.21	1 32.40	15 47.22	1 8.65	4 59 46.73
8	5 2 22.00	21.77	22 47 19.7	19.4	10.327	14.21	1 21.30	15 47.11	1 8.69	5 3 43.28
9	5 6 29.94	29.75	22 52 48.7	48.5	10.338	13.20	1 9.92	15 47.00	1 8.73	5 7 39.84
10	5 10 38.15	37.99	22 57 53.7	53.6	10.348	12.19	0 58.28	15 46.89	1 8.77	5 11 36.40
11	5 14 46.60	46.47	+23 2 34.4	34.3	10.356	+11.18	-0 46.39	15 46.79	1 8.80	5 15 32.96
12	5 18 55.27	55.17	23 6 50.9	50.8	10.364	10.17	0 34.26	15 46.69	1 8.82	5 19 29.52
13	5 23 4.15	4.09	23 10 42.9	42.9	10.371	9.15	0 21.93	15 46.60	1 8.85	5 23 26.07
14	5 27 13.20	13.17	23 14 10.5	10.5	10.378	8.13	0 9.42	15 46.51	1 8.87	5 27 22.62
15	5 31 22.40	22.41	23 17 13.4	13.4	10.385	7.11	+0 3.22	15 46.43	1 8.89	5 31 19.18
16	5 35 31.71	31.75	+23 19 51.6	51.6	10.389	+6.08	+0 15.97	15 46.36	1 8.91	5 35 15.74
17	5 39 41.09	41.17	23 22 5.1	5.1	10.391	5.05	0 28.80	15 46.29	1 8.92	5 39 12.30
18	5 43 50.55	50.67	23 23 54.0	54.0	10.393	4.02	0 41.70	15 46.22	1 8.93	5 43 8.86
19	5 48 0.07	0.23	23 25 18.0	18.0	10.394	2.99	0 54.66	15 46.16	1 8.94	5 47 5.42
20	5 52 9.61	9.81	23 26 17.1	17.1	10.395	1.95	1 7.64	15 46.10	1 8.95	5 51 1.97
21	5 56 19.15	19.39	+23 26 51.4	51.4	10.396	+0.91	+1 20.62	15 46.05	1 8.95	5 54 58.53
22	6 0 28.65	28.93	23 27 0.9	0.9	10.395	-0.12	1 33.58	15 46.00	1 8.95	5 58 55.09
23	6 4 38.11	38.42	23 26 45.6	45.6	10.392	1.15	1 46.49	15 45.95	1 8.94	6 2 51.64
24	6 8 47.51	47.86	23 26 5.5	5.4	10.389	2.18	1 59.34	15 45.91	1 8.93	6 6 48.20
25	6 12 56.81	57.20	23 25 0.7	0.6	10.386	3.21	2 12.08	15 45.87	1 8.92	6 10 44.76
26	6 17 6.02	6.44	+23 23 31.1	30.9	10.383	-4.24	+2 24.73	15 45.83	1 8.91	6 14 41.32
27	6 21 15.11	15.57	23 21 36.9	36.7	10.378	5.27	2 37.27	15 45.79	1 8.89	6 18 37.87
28	6 25 24.05	24.55	23 19 18.3	18.0	10.371	6.29	2 49.66	15 45.76	1 8.86	6 22 34.43
29	6 29 32.84	33.37	23 16 34.8	34.4	10.363	7.31	3 1.89	15 45.74	1 8.83	6 26 30.99
30	6 33 41.46	42.02	23 13 26.6	26.1	10.355	8.33	3 13.95	15 45.72	1 8.80	6 30 27.55
July 1	6 37 49.88	50.47	+23 9 54.3	53.7	10.346	-9.35	+3 25.81	15 45.70	1 8.77	6 34 24.10
2	6 41 58.07	58.70	+23 5 57.7	57.0	10.336	-10.36	+3 37.45	15 45.68	1 8.74	6 38 20.66

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

[Eph 07]

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
July 1	6 37 49.88	50.47	+23 9 54.3	53.7	10.346	-9.35	+3 25.81	15 45.70	1 8.77	6 34 24.10
2	6 41 58.07	58.70	23 5 57.7	57.0	10.336	10.36	3 37.45	15 45.68	1 8.74	6 38 20.66
3	6 46 6.04	6.70	23 1 36.9	36.1	10.326	11.36	3 48.85	15 45.67	1 8.70	6 42 17.22
4	6 50 13.74	14.43	22 56 51.9	51.0	10.314	12.36	3 59.99	15 45.66	1 8.66	6 46 13.78
5	6 54 21.17	21.89	22 51 43.0	42.0	10.302	13.36	4 10.87	15 45.66	1 8.62	6 50 10.33
6	6 58 28.28	29.03	+22 46 10.2	9.1	10.289	-14.36	+4 21.42	15 45.66	1 8.57	6 54 6.89
7	7 2 35.07	35.85	22 40 13.7	12.5	10.275	15.34	4 31.65	15 45.66	1 8.52	6 58 3.45
8	7 6 41.51	42.32	22 33 53.6	52.3	10.260	16.32	4 41.54	15 45.67	1 8.47	7 2 0.00
9	7 10 47.57	48.40	22 27 10.0	8.6	10.244	17.30	4 51.04	15 45.70	1 8.42	7 5 56.56
10	7 14 53.25	54.11	22 20 3.0	1.5	10.227	18.27	5 0.16	15 45.73	1 8.36	7 9 53.12
11	7 18 58.51	59.39	+22 12 33.0	31.3	10.210	-19.23	+5 8.87	15 45.76	1 8.30	7 13 49.67
12	7 23 3.33	4.23	22 4 40.0	38.2	10.191	20.18	5 17.13	15 45.80	1 8.24	7 17 46.23
13	7 27 7.69	8.61	21 56 24.4	22.5	10.172	21.12	5 24.94	15 45.84	1 8.17	7 21 42.79
14	7 31 11.59	12.53	21 47 46.0	44.0	10.153	22.06	5 32.28	15 45.88	1 8.11	7 25 39.34
15	7 35 14.98	15.94	21 38 45.4	43.2	10.131	22.99	5 39.10	15 45.93	1 8.04	7 29 35.90
16	7 39 17.88	18.84	+21 29 22.6	20.3	10.109	-23.91	+5 45.42	15 45.99	1 7.97	7 33 32.46
17	7 43 20.25	21.23	21 19 37.8	35.4	10.087	24.81	5 51.23	15 46.05	1 7.90	7 37 29.02
18	7 47 22.08	23.07	21 9 31.4	28.9	10.064	25.71	5 56.53	15 46.11	1 7.83	7 41 25.57
19	7 51 23.37	24.37	20 59 3.3	0.7	10.041	26.61	6 1.27	15 46.18	1 7.75	7 45 22.13
20	7 55 24.10	25.11	20 48 14.1	11.3	10.018	27.49	6 5.44	15 46.26	1 7.67	7 49 18.68
21	7 59 24.27	25.29	+20 37 3.9	1.0	9.995	-28.36	+6 9.05	15 46.34	1 7.59	7 53 15.24
22	8 3 23.85	24.88	20 25 32.8	29.7	9.971	29.22	6 12.06	15 46.42	1 7.51	7 57 11.80
23	8 7 22.86	23.89	20 13 41.3	38.1	9.947	30.07	6 14.52	15 46.50	1 7.43	8 1 8.35
24	8 11 21.29	22.33	20 1 29.5	26.2	9.923	30.91	6 16.39	15 46.59	1 7.35	8 5 4.91
25	8 15 19.13	20.17	19 48 57.8	54.4	9.900	31.75	6 17.67	15 46.68	1 7.26	8 9 1.46
26	8 19 16.40	17.44	+19 36 6.2	2.7	9.876	-32.56	+6 18.37	15 46.77	1 7.18	8 12 58.02
27	8 23 13.07	14.10	19 22 55.0	51.5	9.852	33.37	6 18.49	15 46.87	1 7.09	8 16 54.58
28	8 27 9.15	10.18	19 9 24.5	20.9	9.827	34.17	6 18.03	15 46.97	1 7.01	8 20 51.13
29	8 31 4.66	5.68	18 55 35.2	31.5	9.803	34.95	6 16.97	15 47.07	1 6.92	8 24 47.69
30	8 34 59.59	60.60	18 41 27.1	23.4	9.778	35.72	6 15.35	15 47.17	1 6.84	8 28 44.24
31	8 38 53.94	54.94	+18 26 60.5	56.7	9.753	-36.49	+6 13.13	15 47.28	1 6.75	8 32 40.80
Aug. 1	8 42 47.69	48.68	18 12 15.7	11.9	9.728	37.24	6 10.32	15 47.40	1 6.67	8 36 37.36
2	8 46 40.87	41.85	17 57 12.9	9.1	9.704	37.98	6 6.95	15 47.52	1 6.58	8 40 33.91
3	8 50 33.44	34.41	17 41 52.6	48.7	9.679	38.71	6 2.97	15 47.64	1 6.50	8 44 30.47
4	8 54 25.45	26.41	17 26 14.8	10.9	9.654	39.43	5 58.41	15 47.77	1 6.41	8 48 27.02
5	8 58 16.84	17.78	+17 10 20.1	16.1	9.629	-40.13	+5 53.24	15 47.80	1 6.32	8 52 23.58
6	9 2 7.67	8.57	16 54 8.5	4.5	9.604	40.83	5 47.51	15 48.04	1 6.23	8 56 20.13
7	9 5 57.89	58.79	16 37 40.6	36.7	9.580	41.50	5 41.17	15 48.18	1 6.14	9 0 16.69
8	9 9 47.54	48.42	16 20 56.4	52.5	9.556	42.17	5 34.27	15 48.33	1 6.05	9 4 13.24
9	9 13 36.59	37.45	16 3 56.5	52.6	9.531	42.83	5 26.76	15 48.48	1 5.96	9 8 9.80
10	9 17 25.05	25.88	+15 46 41.1	37.2	9.506	-43.46	+5 18.67	15 48.63	1 5.88	9 12 6.35
11	9 21 12.94	13.74	15 29 10.4	6.6	9.481	44.09	5 10.01	15 48.79	1 5.80	9 16 2.90
12	9 25 0.25	1.03	15 11 24.8	21.1	9.457	44.71	5 0.76	15 48.96	1 5.72	9 19 59.46
13	9 28 46.99	47.74	14 53 24.7	21.1	9.434	45.31	4 50.94	15 49.13	1 5.64	9 23 56.02
14	9 32 33.14	33.87	14 35 10.4	6.9	9.411	45.89	4 40.55	15 49.31	1 5.56	9 27 52.57
15	9 36 18.75	19.44	+14 16 42.2	38.8	9.388	-46.46	+4 29.60	15 49.49	1 5.49	9 31 49.12
16	9 40 3.79	4.45	+13 57 60.4	57.1	9.365	-47.02	+4 18.07	15 49.67	1 5.41	9 35 45.68

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

[Eph 07]

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	"	m s	h m s
Aug. 16	9 40 3.79	4.45	+ 13 57 60.4	57.1	9.365	-47.02	+ 4 18.07	15 49.67	1 5.41	9 35 45.6
17	9 43 48.29	48.92	13 39 5.3	2.1	9.342	47.56	4 6.02	15 49.85	1 5.34	9 39 42.2
18	9 47 32.24	32.84	13 19 57.3	54.2	9.321	48.09	3 53.42	15 50.04	1 5.26	9 43 38.7
19	9 51 15.68	16.25	13 0 36.7	33.8	9.300	48.61	3 40.31	15 50.23	1 5.19	9 47 35.3
20	9 54 58.59	59.12	12 41 3.7	0.9	9.279	49.12	3 26.66	15 50.42	1 5.12	9 51 31.9
21	9 58 41.01	41.50	+ 12 21 18.7	16.1	9.259	-49.61	+ 3 12.53	15 50.62	1 5.05	9 55 28.4
22	10 2 22.95	23.40	12 1 22.2	19.8	9.239	50.09	2 57.92	15 50.82	1 4.98	9 59 25.0
23	10 6 4.43	4.84	11 41 14.2	12.0	9.219	50.56	2 42.85	15 51.02	1 4.91	10 3 21.5
24	10 9 45.48	45.85	11 20 55.1	53.1	9.202	51.01	2 27.34	15 51.22	1 4.85	10 7 18.1
25	10 13 26.10	26.43	11 0 25.1	23.3	9.186	51.45	2 11.42	15 51.42	1 4.78	10 11 14.6
26	10 17 6.32	6.61	+ 10 39 44.7	43.1	9.170	-51.89	+ 1 55.08	15 51.63	1 4.72	10 15 11.2
27	10 20 46.13	46.38	10 18 54.1	52.7	9.154	52.31	1 38.34	15 51.84	1 4.66	10 19 7.7
28	10 24 25.58	25.79	9 57 53.6	52.4	9.139	52.72	1 21.24	15 52.05	1 4.60	10 23 4.3
29	10 28 4.67	4.83	9 36 43.5	42.6	9.124	53.11	1 3.77	15 52.26	1 4.54	10 27 0.8
30	10 31 43.41	43.52	9 15 24.2	23.6	9.110	53.49	0 45.97	15 52.47	1 4.49	10 30 57.4
Sept. 1	10 35 21.83	21.89	+ 8 53 55.9	55.6	9.096	-53.86	+ 0 27.84	15 52.69	1 4.44	10 34 53.9
2	10 38 59.94	59.96	8 32 19.0	18.9	9.082	54.21	+ 0 9.39	15 52.91	1 4.40	10 38 50.5
3	10 42 37.76	37.73	8 10 33.7	33.9	9.070	54.55	- 0 9.33	15 53.13	1 4.36	10 42 47.0
4	10 46 15.30	15.23	7 48 40.5	41.0	9.059	54.88	0 28.34	15 53.36	1 4.32	10 46 43.6
5	10 49 52.58	52.46	7 26 39.7	40.5	9.048	55.18	0 47.61	15 53.59	1 4.28	10 50 40.2
6	10 53 29.62	29.45	+ 7 4 31.5	32.6	9.037	-55.48	- 1 7.12	15 53.82	1 4.24	10 54 36.7
7	10 57 6.41	6.19	6 42 16.3	17.7	9.027	55.77	1 26.88	15 54.06	1 4.20	10 58 33.3
8	11 0 43.00	42.73	6 19 54.5	56.2	9.018	56.04	1 46.84	15 54.30	1 4.17	11 2 29.8
9	11 4 19.37	19.05	5 57 26.3	28.3	9.011	56.29	2 7.02	15 54.54	1 4.14	11 6 26.4
10	11 7 55.55	55.18	5 34 52.3	54.6	9.004	56.53	2 27.38	15 54.79	1 4.12	11 10 22.9
11	11 11 31.55	31.13	+ 5 12 12.5	15.1	8.997	-56.75	- 2 47.92	15 55.04	1 4.10	11 14 19.5
12	11 15 7.41	6.94	4 49 27.5	30.5	8.990	56.96	3 8.60	15 55.30	1 4.08	11 18 16.0
13	11 18 43.13	42.61	4 26 37.6	40.9	8.984	57.16	3 29.45	15 55.56	1 4.06	11 22 12.6
14	11 22 18.71	18.14	4 3 43.1	46.8	8.979	57.34	3 50.42	15 55.82	1 4.05	11 26 9.1
15	11 25 54.20	53.58	3 40 44.4	48.4	8.976	57.52	4 11.46	15 56.08	1 4.04	11 30 5.7
16	11 29 29.60	28.92	+ 3 17 41.8	46.2	8.974	-57.68	- 4 32.61	15 56.34	1 4.03	11 34 2.2
17	11 33 4.91	4.18	2 54 35.7	40.4	8.972	57.82	4 53.85	15 56.60	1 4.02	11 37 58.8
18	11 36 40.18	39.40	2 31 26.3	31.4	8.970	57.94	5 15.13	15 56.87	1 4.01	11 41 55.3
19	11 40 15.43	14.60	2 8 14.1	19.5	8.970	58.05	5 36.42	15 57.13	1 4.01	11 45 51.9
20	11 43 50.67	49.78	1 44 59.4	65.1	8.971	58.15	5 57.73	15 57.40	1 4.01	11 49 48.4
21	11 47 25.93	24.99	+ 1 21 42.5	48.6	8.972	-58.25	- 6 19.02	15 57.67	1 4.02	11 43 45.0
22	11 51 1.23	0.24	0 58 23.5	29.9	8.975	58.32	6 40.27	15 57.94	1 4.03	11 57 41.5
23	11 54 36.61	35.56	0 35 3.1	9.9	8.978	58.38	7 1.43	15 58.20	1 4.04	12 1 38.1
24	11 58 12.09	10.98	+ 0 11 41.3	48.5	8.981	58.43	7 22.50	15 58.47	1 4.05	12 5 34.7
25	12 1 47.69	46.53	- 0 11 41.5	34.0	8.986	58.46	7 43.45	15 58.74	1 4.07	12 9 31.2
26	12 5 23.43	22.23	- 0 34 65.0	57.1	8.994	-58.48	- 8 4.25	15 59.01	1 4.09	12 13 27.8
27	12 8 59.33	58.08	0 58 28.8	20.6	9.002	58.49	8 24.90	15 59.27	1 4.12	12 17 24.3
28	12 12 35.41	34.10	1 21 52.5	44.1	9.010	58.48	8 45.38	15 59.54	1 4.15	12 21 20.9
29	12 16 11.70	10.34	1 45 16.1	7.3	9.019	58.46	9 5.63	15 59.81	1 4.18	12 25 17.4
30	12 19 48.23	46.82	2 8 38.8	29.7	9.028	58.43	9 25.66	16 0.08	1 4.21	12 29 14.0
Oct. 1	12 23 25.00	23.54	- 2 31 60.6	51.1	9.038	-58.38	- 9 45.43	16 0.35	1 4.24	12 33 10.5
2	12 27 2.05	0.54	- 2 55 21.0	11.2	9.050	-58.32	- 10 4.93	16 0.62	1 4.28	12 37 7.1

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0<sup>s</sup>.18 from the sidereal interval.

[Rph 07]

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi- diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.	
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declina- tion.					
	h m s	s	° ' "	"	s	"	m s	"	m s	h m s	
Oct.	1	12 27 2.05	0.54	2 55 21.0	11.2	9.050	-58.32	10 4.93	16 0.62	1 4.28	12 37 7.12
	2	12 30 39.38	37.81	3 18 39.7	29.5	9.063	58.24	10 24.15	16 0.89	1 4.32	12 41 3.67
	3	12 34 17.03	15.41	3 41 56.3	45.8	9.076	58.15	10 43.05	16 1.16	1 4.37	12 45 0.22
	4	12 37 55.01	53.34	4 4 70.5	59.7	9.090	58.05	11 1.63	16 1.43	1 4.42	12 48 56.77
	5	12 41 33.32	31.60	4 28 21.9	10.9	9.104	57.93	11 19.86	16 1.71	1 4.47	12 52 53.32
	6	12 45 11.99	10.22	4 51 30.1	18.8	9.119	-57.80	11 37.75	16 1.98	1 4.52	12 56 49.88
	7	12 48 51.05	49.23	5 14 34.8	23.3	9.136	57.65	11 55.23	16 2.26	1 4.58	13 0 46.43
	8	12 52 30.51	28.64	5 37 35.5	23.7	9.153	57.48	12 12.33	16 2.54	1 4.64	13 4 42.98
	9	12 56 10.37	8.46	6 0 31.7	19.7	9.170	57.29	12 29.03	16 2.82	1 4.70	13 8 39.54
	10	12 59 50.65	48.70	6 23 23.3	11.1	9.187	57.07	12 45.30	16 3.10	1 4.77	13 12 36.09
	11	13 3 31.38	29.39	6 45 69.7	57.3	9.204	-56.84	13 1.12	16 3.38	1 4.84	13 16 32.64
	12	13 7 12.56	10.52	7 8 50.5	37.9	9.224	56.58	13 16.49	16 3.66	1 4.92	13 20 29.19
	13	13 10 54.21	52.13	7 31 25.5	12.7	9.245	56.32	13 31.40	16 3.94	1 4.99	13 24 25.75
	14	13 14 36.37	34.24	7 53 54.2	41.3	9.267	56.05	13 45.80	16 4.22	1 5.07	13 28 22.30
	15	13 18 19.04	16.87	8 16 16.2	3.2	9.289	55.77	13 59.68	16 4.50	1 5.15	13 32 18.85
	16	13 22 2.23	0.02	8 38 31.1	18.0	9.312	-55.46	14 13.06	16 4.78	1 5.23	13 36 15.41
	17	13 25 45.97	43.72	9 0 38.5	25.3	9.336	55.14	14 25.87	16 5.06	1 5.32	13 40 11.96
	18	13 29 30.28	27.99	9 22 38.1	24.8	9.360	54.81	14 38.10	16 5.34	1 5.40	13 44 8.51
	19	13 33 15.17	12.84	9 44 29.5	16.1	9.384	54.46	14 49.78	16 5.63	1 5.49	13 48 5.07
	20	13 36 60.68	58.32	10 5 72.3	58.9	9.410	54.09	15 0.83	16 5.90	1 5.58	13 52 1.62
	21	13 40 46.82	44.43	10 27 46.3	32.8	9.436	-53.71	15 11.24	16 6.17	1 5.67	13 55 58.17
	22	13 44 33.62	31.19	10 48 71.0	57.5	9.463	53.32	15 21.01	16 6.44	1 5.76	13 59 54.73
	23	13 48 21.07	18.61	11 10 26.0	12.4	9.492	52.91	15 30.11	16 6.70	1 5.86	14 3 51.28
	24	13 52 9.22	6.73	11 31 30.9	17.3	9.522	52.49	15 38.53	16 6.96	1 5.96	14 7 47.84
	25	13 55 58.09	55.57	11 52 25.5	11.9	9.553	52.04	15 46.22	16 7.22	1 6.06	14 11 44.39
	26	13 59 47.67	45.12	12 12 69.3	55.7	9.584	-51.59	15 53.20	16 7.48	1 6.16	14 15 40.94
	27	14 3 37.99	35.41	12 33 42.0	28.4	9.615	51.12	15 59.44	16 7.73	1 6.27	14 19 37.50
	28	14 7 29.04	26.44	12 53 63.0	49.5	9.647	50.62	16 4.95	16 7.98	1 6.37	14 23 34.05
	29	14 11 20.87	18.25	13 13 71.9	58.5	9.678	50.12	16 9.68	16 8.23	1 6.48	14 27 30.60
	30	14 15 13.48	10.84	13 33 68.6	55.3	9.710	49.60	16 13.64	16 8.48	1 6.59	14 31 27.16
	31	14 19 6.88	4.23	13 53 52.3	39.1	9.742	-49.06	16 16.79	16 8.73	1 6.70	14 35 23.71
Nov.	1	14 22 61.09	58.42	14 13 23.0	9.9	9.775	48.50	16 19.15	16 8.98	1 6.82	14 39 20.27
	2	14 26 56.09	53.42	14 32 40.1	27.2	9.808	47.92	16 20.71	16 9.23	1 6.93	14 43 16.82
	3	14 30 51.90	49.22	14 51 43.1	30.4	9.842	47.33	16 21.47	16 9.48	1 7.05	14 47 13.38
	4	14 34 48.54	45.85	15 10 31.7	19.1	9.876	46.72	16 21.39	16 9.72	1 7.17	14 51 9.93
	5	14 38 46.01	43.31	15 28 65.4	53.0	9.911	-46.08	16 20.49	16 9.96	1 7.29	14 55 6.49
	6	14 42 44.29	41.58	15 47 23.8	11.6	9.946	45.44	16 18.78	16 10.20	1 7.41	14 59 3.04
	7	14 46 43.42	40.70	16 5 26.6	14.6	9.981	44.77	16 16.21	16 10.44	1 7.53	15 2 59.60
	8	14 50 43.36	40.64	16 23 13.2	1.4	10.015	44.09	16 12.83	16 10.68	1 7.64	15 6 56.15
	9	14 54 44.13	41.42	16 40 43.1	31.6	10.049	43.39	16 8.63	16 10.92	1 7.76	15 10 52.71
	10	14 58 45.73	43.03	16 57 56.1	44.8	10.083	-42.67	16 3.57	16 11.16	1 7.88	15 14 49.26
	11	15 2 48.16	45.47	17 14 51.7	40.7	10.118	41.94	15 57.72	16 11.40	1 8.00	15 18 45.82
	12	15 6 51.40	48.72	17 31 29.4	18.7	10.153	41.19	15 51.05	16 11.63	1 8.12	15 22 42.37
	13	15 10 55.50	52.83	17 47 48.9	38.5	10.188	40.42	15 43.52	16 11.86	1 8.24	15 26 38.93
	14	15 14 60.42	57.76	18 3 49.8	39.7	10.223	39.63	15 35.15	16 12.09	1 8.36	15 30 35.48
	15	15 19 6.18	3.54	18 19 31.5	21.7	10.257	-38.83	15 25.97	16 12.31	1 8.48	15 34 32.04
	16	15 23 12.76	10.15	18 34 53.9	44.4	10.292	38.01	15 15.95	16 12.52	1 8.60	15 38 28.60

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.18 from the sidereal interval.

[Eph 07]



## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	"	m s	h m s
Nov. 16	15 23 12.76	10.15	18 34 53.9	44.4	10.292	-38.01	15 15.95	16 12.52	1 8.60	15 38 28.60
17	15 27 20.17	17.59	18 49 56.4	47.2	10.327	37.19	15 5.10	16 12.73	1 8.72	15 42 25.15
18	15 31 28.41	25.85	19 4 38.9	29.9	10.361	36.34	14 53.42	16 12.94	1 8.84	15 46 21.71
19	15 35 37.47	34.93	19 18 60.9	52.4	10.396	35.48	14 40.92	16 13.15	1 8.95	15 50 18.26
20	15 39 47.37	44.86	19 32 61.9	53.7	10.431	34.60	14 27.58	16 13.35	1 9.06	15 54 14.82
21	15 43 58.09	55.61	19 46 41.8	33.9	10.465	-33.71	14 13.43	16 13.54	1 9.17	15 58 11.38
22	15 48 9.61	7.15	19 59 60.0	52.4	10.498	32.80	13 58.47	16 13.73	1 9.28	16 2 7.93
23	15 52 21.93	19.52	20 12 56.4	49.2	10.531	31.88	13 42.71	16 13.92	1 9.39	16 6 4.49
24	15 56 35.07	32.70	20 25 30.5	23.7	10.564	30.95	13 26.13	16 14.10	1 9.49	16 10 1.04
25	16 0 48.99	46.67	20 37 42.0	35.6	10.597	29.99	13 8.78	16 14.28	1 9.60	16 13 57.60
26	16 5 3.69	1.41	20 49 30.6	24.6	10.630	-29.03	12 50.64	16 14.45	1 9.70	16 17 54.16
27	16 9 19.16	16.93	21 0 55.9	50.2	10.662	28.06	12 31.73	16 14.62	1 9.81	16 21 50.72
28	16 13 35.38	33.20	21 11 57.6	52.3	10.692	27.08	12 12.06	16 14.78	1 9.91	16 25 47.27
29	16 17 52.33	50.21	21 22 35.4	30.4	10.721	26.07	11 51.67	16 14.94	1 10.01	16 29 43.83
30	16 22 10.00	7.95	21 32 48.9	44.3	10.750	25.06	11 30.56	16 15.10	1 10.10	16 33 40.39
Dec. 1	16 26 28.36	26.38	21 42 37.9	33.6	10.779	-24.03	11 8.75	16 15.25	1 10.19	16 37 36.94
2	16 30 47.41	45.49	21 51 62.1	58.0	10.805	22.99	10 46.26	16 15.40	1 10.28	16 41 33.50
3	16 35 7.09	5.23	22 0 61.1	57.4	10.830	21.93	10 23.14	16 15.55	1 10.37	16 45 30.06
4	16 39 27.41	25.62	22 9 34.7	31.3	10.855	20.87	9 59.38	16 15.69	1 10.45	16 49 26.62
5	16 43 48.32	46.60	22 17 42.6	39.5	10.880	19.79	9 35.02	16 15.83	1 10.52	16 53 23.17
6	16 48 9.79	8.14	22 25 24.5	21.7	10.904	-18.70	9 10.10	16 15.97	1 10.59	16 57 19.73
7	16 52 31.81	30.23	22 32 40.4	38.0	10.927	17.60	8 44.63	16 16.11	1 10.66	17 1 16.29
8	16 56 54.33	52.82	22 39 29.6	27.4	10.948	16.49	8 18.67	16 16.24	1 10.73	17 5 12.85
9	17 1 17.32	15.89	22 45 52.0	50.1	10.968	15.37	7 52.23	16 16.37	1 10.80	17 9 9.40
10	17 5 40.74	39.38	22 51 47.6	46.0	10.985	14.24	7 25.36	16 16.49	1 10.86	17 13 5.96
11	17 10 4.58	3.30	22 57 16.2	14.8	11.001	-13.11	6 58.07	16 16.61	1 10.92	17 17 2.52
12	17 14 28.80	27.61	23 2 17.4	16.2	11.016	11.97	6 30.41	16 16.72	1 10.97	17 20 59.08
13	17 18 53.36	52.26	23 6 51.2	50.2	11.030	10.83	6 2.39	16 16.83	1 11.02	17 24 55.63
14	17 23 18.25	17.23	23 10 57.4	56.6	11.043	9.68	5 34.05	16 16.94	1 11.07	17 28 52.19
15	17 27 43.42	42.49	23 14 35.8	35.2	11.054	8.52	5 5.43	16 17.04	1 11.11	17 32 48.75
16	17 32 8.87	8.03	23 17 46.5	45.9	11.065	-7.36	4 36.54	16 17.14	1 11.15	17 36 45.31
17	17 36 34.54	33.79	23 20 29.0	28.6	11.075	6.19	4 7.40	16 17.23	1 11.18	17 40 41.86
18	17 40 60.41	59.75	23 22 43.6	43.3	11.083	5.02	3 38.09	16 17.31	1 11.20	17 44 38.42
19	17 45 26.47	25.90	23 24 30.1	29.9	11.090	3.85	3 8.58	16 17.38	1 11.22	17 48 34.98
20	17 49 52.66	52.18	23 25 48.5	48.4	11.095	2.68	2 38.94	16 17.45	1 11.24	17 52 31.54
21	17 54 18.96	18.57	23 26 38.7	38.7	11.099	-1.51	2 9.19	16 17.51	1 11.25	17 56 28.10
22	17 58 45.34	45.04	23 27 0.7	0.7	11.101	-0.33	1 39.34	16 17.57	1 11.26	18 0 24.65
23	18 3 11.78	11.57	23 26 54.3	54.3	11.102	+0.85	1 9.45	16 17.62	1 11.26	18 4 21.21
24	18 7 38.23	38.11	23 26 19.8	19.8	11.102	2.03	0 39.56	16 17.67	1 11.26	18 8 17.77
25	18 12 4.68	4.65	23 25 17.0	17.0	11.101	3.21	0 9.66	16 17.71	1 11.26	18 12 14.33
26	18 16 31.08	31.13	23 23 45.8	45.8	11.098	+4.39	0 20.19	16 17.75	1 11.25	18 16 10.89
27	18 20 57.40	57.55	23 21 46.5	46.4	11.095	5.56	0 49.97	16 17.77	1 11.23	18 20 7.44
28	18 25 23.61	23.85	23 19 19.1	18.9	11.090	6.73	1 19.63	16 17.79	1 11.21	18 24 4.00
29	18 29 49.68	50.01	23 16 23.7	23.4	11.082	7.90	1 49.15	16 17.81	1 11.18	18 28 0.56
30	18 34 15.56	15.98	23 12 60.2	59.8	11.073	9.06	2 18.49	16 17.83	1 11.15	18 31 57.12
31	18 38 41.24	41.75	23 9 8.7	8.2	11.063	+10.22	2 47.60	16 17.84	1 11.12	18 35 53.68
32	18 43 6.66	7.26	23 4 49.5	48.9	11.053	+11.38	3 16.48	16 17.85	1 11.08	18 39 50.24

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

[Eph 07]

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Jan. 1	14 0.82	2.015	8 43 54.84	131.10	+ 18 41 47.9	- 325.0	65.50	14 58.0	54 49.0	II. S.
2	14 48.78	1.981	9 35 57.08	129.03	16 4 53.4	456.5	65.03	15 4.9	55 14.3	II. S.
3	15 35.92	1.949	10 27 9.67	127.12	12 39 14.3	568.1	64.60	15 13.2	55 45.0	II. S.
4	16 22.46	1.933	11 17 46.37	126.17	8 33 37.6	655.9	64.41	15 23.1	56 21.2	II. S.
5	17 8.94	1.946	12 8 19.16	126.89	+ 3 58 2.4	717.4	64.64	15 34.3	57 2.7	II. S.
6	17 56.12	1.993	12 59 34.48	129.78	- 0 56 15.4	- 748.6	65.40	15 46.8	57 49.0	II. S.
7	18 44.94	2.082	13 52 28.23	135.11	5 55 59.2	743.3	66.77	16 0.1	58 38.0	II. S.
8	19 36.37	2.209	14 47 58.77	142.78	10 44 50.6	692.6	68.67	16 13.4	59 26.5	II. S.
9	20 31.21	2.363	15 46 54.84	152.04	15 2 38.6	586.5	70.89	16 25.3	60 10.1	II. S.
10	21 29.79	2.515	16 49 35.82	161.16	18 25 56.0	419.8	73.01	16 34.5	60 43.4	II. S.
11	22 31.55	2.621	17 55 28.17	167.51	- 20 31 18.9	- 199.8	74.45	16 39.2	61 1.0	II. S.
12	23 34.88	2.640	19 2 55.06	168.71	21 1 59.8	+ 48.0	74.72	16 39.3	60 59.6	
14	0 37.52	2.564	20 9 40.06	164.12	19 54 18.2	285.5	73.65	16 33.5	60 38.2	
15	1 37.39	2.418	21 13 39.24	155.32	17 19 26.4	479.5	71.53	16 21.9	59 59.1	I. S.
16	2 33.37	2.246	22 13 43.55	145.00	13 38 41.3	613.9	69.08	16 8.0	59 7.4	I. S.
17	3 25.32	2.087	23 9 45.22	135.40	- 9 16 5.8	+ 689.9	66.76	15 52.4	58 9.5	I. S.
18	4 13.80	1.960	0 2 18.94	127.80	- 4 33 10.8	717.6	64.85	15 36.4	57 10.9	I. S.
19	4 59.74	1.875	0 52 19.28	122.66	+ 0 13 2.9	708.2	63.54	15 21.7	56 16.5	I. S.
20	5 44.11	1.830	1 40 45.64	119.94	4 49 43.1	671.0	62.84	15 9.0	55 29.7	I. S.
21	6 27.86	1.821	2 28 34.11	119.44	9 6 51.7	611.1	62.70	14 58.8	54 52.5	I. S.
22	7 11.78	1.843	3 16 33.33	120.77	+ 12 56 6.2	+ 531.7	63.03	14 51.5	54 25.8	I. S.
23	7 56.52	1.888	4 5 21.50	123.43	16 9 39.6	432.9	63.68	14 47.0	54 9.7	I. S.
24	8 42.48	1.943	4 55 23.04	126.76	18 39 54.3	315.2	64.51	14 45.4	54 3.6	I. S.
25	9 29.78	1.997	5 46 45.37	130.02	20 19 29.8	180.0	65.27	14 46.1	54 6.3	I. S.
26	10 18.24	2.037	6 39 17.25	132.44	21 2 6.8	+ 31.2	65.83	14 48.9	54 16.8	I. N. S.
27	11 7.39	2.055	7 32 31.28	133.46	+ 20 43 34.9	- 124.3	66.03	14 53.3	54 33.1	I. N. S.
28	11 56.65	2.047	8 25 51.64	132.98	19 22 57.7	277.6	65.89	14 59.2	54 54.2	I. N. S.
29	12 45.47	2.019	9 18 45.24	131.33	17 3 4.7	419.1	65.48	15 5.9	55 18.8	II. S.
30	13 33.51	1.984	10 10 51.91	129.21	13 50 19.0	540.9	64.96	15 13.3	55 45.9	II. S.
31	14 20.74	1.954	11 2 10.23	127.44	9 53 50.5	636.9	64.55	15 21.2	56 14.9	II. S.
Feb. 1	15 7.47	1.943	11 52 58.05	126.79	+ 5 24 41.6	- 703.7	64.44	15 29.6	56 45.7	II. S.
2	15 54.26	1.961	12 43 49.70	127.84	+ 0 35 9.3	738.4	64.78	15 38.3	57 17.9	II. S.
3	16 41.88	2.013	13 35 31.20	130.99	- 4 21 18.7	737.7	65.66	15 47.5	57 51.5	II. S.
4	17 31.19	2.102	14 28 54.85	136.34	9 9 45.9	697.5	67.05	15 56.9	58 25.9	II. S.
5	18 23.04	2.223	15 24 50.74	143.58	13 33 12.7	611.7	68.89	16 6.0	58 59.5	II. S.
6	19 18.01	2.358	16 23 54.32	151.74	- 17 12 28.5	- 476.0	70.88	16 14.3	59 30.2	II. S.
7	20 16.14	2.481	17 26 8.54	159.11	19 47 23.5	290.9	72.58	16 21.1	59 54.8	II. S.
8	21 16.69	2.534	18 30 47.93	163.49	21 0 8.9	- 68.4	73.55	16 25.2	60 10.0	II. N. S.
9	22 18.10	2.550	19 36 19.00	163.26	20 40 24.2	+ 166.5	73.43	16 25.8	60 12.1	II. N.
10	23 18.40	2.469	20 40 47.42	158.43	18 49 32.3	382.1	72.25	16 22.5	59 59.8	
12	0 16.23	2.339	21 42 39.36	150.58	- 15 40 46.3	+ 552.7	70.35	16 15.2	59 32.8	
13	1 10.62	2.194	22 41 8.40	141.86	11 34 56.4	666.6	68.22	16 4.5	58 53.4	I. S.
14	2 1.66	2.063	23 36 15.58	133.99	6 54 52.2	744.9	66.27	15 51.4	58 5.7	I. S.
15	2 49.89	1.962	0 28 33.87	127.88	- 2 1 17.5	735.8	64.75	15 37.4	57 14.4	I. S.
16	3 36.11	1.896	1 18 51.08	123.91	+ 2 48 54.1	+ 709.5	63.79	15 23.8	56 24.0	I. S.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Feb. 17	4 21.16	1.864	2 7 58.32	122.04	+ 7 22 34.4	+ 654.5	63.30	15 11.3	55 38.6	I. S.
18	5 5.85	1.864	2 56 43.40	122.02	11 29 31.0	576.7	63.38	15 1.1	55 0.6	I. S.
19	5 50.84	1.888	3 45 46.76	123.48	15 1 21.0	479.4	63.79	14 53.5	54 33.3	I. S.
20	6 36.63	1.929	4 35 38.31	125.94	17 50 43.1	364.6	64.44	14 49.0	54 16.6	I. S.
21	7 23.50	1.976	5 26 34.66	128.77	19 50 52.6	233.6	65.15	14 47.4	54 10.9	I. S.
22	8 11.46	2.019	6 18 36.84	131.31	+ 20 55 50.4	+ 89.2	65.75	14 48.8	54 15.9	I. N. S.
23	9 0.28	2.046	7 11 30.62	132.98	21 0 58.5	- 64.5	66.13	14 52.8	54 30.4	I. N.
24	9 49.53	2.055	8 4 50.53	133.46	20 3 53.7	220.6	66.17	14 58.8	54 52.9	I. N.
25	10 38.74	2.044	8 58 7.73	132.80	18 5 17.3	370.6	65.93	15 6.7	55 21.5	I. N.
26	11 27.53	2.021	9 50 59.35	131.43	15 9 22.6	505.7	65.53	15 15.4	55 53.6	I. N.
27	12 15.73	1.997	10 43 15.86	130.00	+ 11 23 46.8	- 617.8	65.15	15 24.6	56 27.3	I. II. N.
28	13 3.46	1.984	11 35 4.17	129.19	6 59 5.4	700.1	64.95	15 33.6	57 0.4	II. S.
Mar. 1	13 51.10	1.991	12 26 47.02	129.63	+ 2 8 15.6	747.7	65.11	15 42.0	57 31.4	II. S.
2	14 39.22	2.026	13 18 59.40	131.70	- 2 53 54.8	756.3	65.71	15 49.6	57 59.2	II. S.
3	15 28.55	2.090	14 12 23.40	135.60	7 51 7.2	722.3	66.77	15 56.2	58 23.3	II. S.
4	16 19.77	2.182	15 7 41.06	141.11	- 12 25 47.1	- 643.1	68.22	16 1.7	58 43.4	II. S.
5	17 13.40	2.289	16 5 24.24	147.55	16 19 25.6	517.2	69.87	16 6.2	59 0.0	II. S.
6	18 9.59	2.391	17 5 41.60	153.70	19 13 40.7	347.1	71.37	16 9.5	59 12.4	II. S.
7	19 7.90	2.461	18 8 6.56	157.91	20 52 28.4	- 142.3	72.36	16 11.6	59 20.2	II. S.
8	20 7.26	2.475	19 11 34.44	158.77	21 5 16.0	+ 79.2	72.53	16 12.2	59 22.1	II. N.
9	21 6.22	2.428	20 14 37.92	155.91	- 19 50 8.7	+ 293.2	71.78	16 10.8	59 17.0	II. N.
10	22 3.41	2.332	21 15 55.36	150.17	17 14 48.1	477.0	70.32	16 7.2	59 3.6	II. N.
11	22 57.99	2.215	22 14 35.63	143.10	13 34 39.7	615.5	68.54	16 1.2	58 41.5	II. N.
12	23 49.74	2.100	23 10 25.66	136.20	9 9 16.5	703.0	66.80	15 53.0	58 11.3	
14	0 38.95	2.005	0 3 43.14	120.50	- 4 18 49.0	741.6	65.32	15 42.9	57 34.5	
15	1 26.22	1.939	0 55 3.52	126.50	+ 0 38 13.5	+ 737.1	64.31	15 31.8	56 53.9	I. S.
16	2 12.24	1.901	1 45 9.08	124.27	5 26 3.7	696.7	63.79	15 20.6	56 12.5	I. S.
17	2 57.72	1.892	2 34 41.49	123.69	9 51 43.0	627.2	63.68	15 9.9	55 33.7	I. S.
18	3 43.24	1.905	3 24 17.01	124.47	13 44 38.1	533.8	63.92	15 0.9	55 0.4	I. S.
19	4 29.23	1.933	4 14 23.37	126.79	16 56 9.9	420.8	64.49	14 54.0	54 35.0	I. S.
20	5 16.01	1.969	5 5 17.20	128.32	+ 19 19 6.7	+ 291.4	65.09	14 49.7	54 19.2	I. S.
21	6 3.75	2.003	5 57 2.53	130.38	20 47 36.3	+ 149.2	65.65	14 48.4	54 14.5	I. N. S.
22	6 52.19	2.028	6 49 31.03	131.86	21 17 13.8	- 2.1	66.02	14 50.1	54 20.8	I. N.
23	7 41.01	2.038	7 42 25.11	132.49	20 45 23.5	157.3	66.14	14 54.8	54 38.0	I. N.
24	8 29.91	2.035	8 35 23.72	132.27	19 11 48.7	309.7	66.03	15 2.2	55 5.0	I. N.
25	9 18.60	2.022	9 28 9.53	131.49	+ 16 38 51.5	- 452.8	65.74	15 11.7	55 40.1	I. N.
26	10 6.95	2.008	10 20 35.07	130.68	13 11 47.0	579.1	65.49	15 22.8	56 20.7	I. N.
27	10 55.06	2.003	11 12 46.23	130.39	8 58 49.1	681.0	65.36	15 34.5	57 3.6	I. N.
28	11 43.26	2.016	12 5 2.52	131.18	+ 4 11 12.4	751.0	65.53	15 45.9	57 45.5	I. N.
29	12 32.05	2.054	12 57 54.76	133.43	- 0 56 47.0	781.7	66.11	15 56.1	58 23.1	II. N.
30	13 22.07	2.119	13 52 0.60	137.32	- 6 8 0.9	- 766.2	67.14	16 4.5	58 53.6	II. S.
31	14 13.93	2.207	14 47 57.41	142.62	11 2 56.5	699.5	68.52	16 10.4	59 14.9	II. S.
Apr. 1	15 8.10	2.307	15 46 12.51	148.67	15 20 37.8	580.2	70.08	16 13.5	59 26.7	II. S.
2	16 4.62	2.400	16 46 50.08	154.25	- 18 40 34.3	- 472.1	71.49	16 14.2	59 29.5	II. S.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Apr. 3	17 3-03	2.459	17 49 20.49	157.81	-20 45 25.4	-207.4	72.40	16 12.8	59 24.5	II. N. S.
4	18 2.23	2.464	18 52 39.05	158.12	21 24 15.5	+14.2	72.49	16 9.8	59 13.5	II. N.
5	19 0.84	2.411	19 55 21.89	154.90	20 35 8.0	229.2	71.72	16 5.5	58 57.4	II. N.
6	19 57.60	2.313	20 56 13.04	149.04	18 24 29.4	417.2	70.25	16 0.1	58 37.6	II. N.
7	20 51.74	2.197	21 54 26.78	142.05	15 6 35.0	564.9	68.46	15 53.8	58 14.7	II. N.
8	21 43.10	2.086	22 49 53.66	135.34	-10 58 35.2	+667.4	66.70	15 46.7	57 48.5	II. N.
9	22 32.01	1.995	23 42 52.97	129.86	6 18 37.5	725.1	65.24	15 38.8	57 19.7	II. N.
10	23 19.07	1.931	0 34 0.59	126.07	-1 23 59.5	741.4	64.20	15 30.2	56 48.6	
12	0 4.97	1.898	1 23 58.58	124.65	+3 29 35.0	720.5	63.67	15 21.5	56 16.2	
13	0 50.39	1.891	2 13 27.87	123.65	8 8 7.4	667.0	63.58	15 12.8	55 44.0	
14	1 35.92	1.906	3 3 3.65	124.52	+12 19 24.0	+584.9	63.86	15 4.5	55 13.5	I. S.
15	2 21.99	1.935	3 53 11.88	126.27	15 52 53.4	478.8	64.38	14 57.3	54 47.0	I. S.
16	3 8.83	1.969	4 44 6.73	128.31	18 39 46.5	352.7	64.98	14 51.7	54 26.8	I. S.
17	3 56.47	2.000	5 35 49.38	130.16	20 33 4.8	211.7	65.54	14 48.3	54 14.4	I. N.
18	4 44.72	2.019	6 28 8.77	131.32	21 27 51.8	+61.1	65.89	14 47.5	54 11.3	I. N.
19	5 33.25	2.023	7 20 45.58	131.58	+21 21 27.0	-93.3	66.01	14 49.6	54 18.8	I. N.
20	6 21.73	2.014	8 13 18.47	131.02	20 13 30.0	245.6	65.88	14 54.6	54 37.1	I. N.
21	7 9.87	1.997	9 5 31.43	130.01	18 5 58.8	390.3	65.59	15 2.5	55 6.2	I. N.
22	7 57.59	1.981	9 57 19.28	129.05	15 2 58.8	522.2	65.29	15 13.0	55 45.0	I. N.
23	8 45.05	1.976	10 48 50.85	128.75	11 10 40.5	635.9	65.16	15 25.6	56 31.4	I. N.
24	9 32.61	1.991	11 40 28.90	129.67	+6 37 31.3	-725.1	65.35	15 39.6	57 22.5	I. N.
25	10 20.85	2.034	12 32 48.00	132.22	+1 34 48.9	782.2	65.94	15 53.7	58 14.3	I. N.
26	11 10.49	2.108	13 26 30.78	136.65	-3 42 40.0	797.3	67.04	16 6.8	59 2.2	I. N.
27	12 2.25	2.210	14 22 21.43	142.83	8 56 8.5	760.5	68.59	16 17.6	59 41.4	I. II. N.
28	12 56.72	2.331	15 20 55.50	150.10	13 43 9.6	664.1	70.39	16 24.9	60 7.8	II. N.
29	13 54.11	2.448	16 22 24.59	157.13	-17 39 21.4	-507.2	72.14	16 27.8	60 19.4	II. N. S.
30	14 53.93	2.528	17 26 20.05	161.97	20 22 8.1	299.9	73.37	16 26.9	60 16.0	II. N. S.
May 1	15 54.94	2.544	18 31 27.26	162.88	21 35 36.8	-65.4	73.62	16 22.3	59 59.4	II. N.
2	16 55.41	2.485	19 36 2.43	159.34	21 14 48.6	+166.5	72.83	16 15.0	59 32.8	II. N.
3	17 53.74	2.369	20 38 28.36	152.39	19 26 19.1	369.6	71.18	16 6.1	58 59.8	II. N.
4	18 48.94	2.229	21 37 45.91	143.99	-16 25 6.3	+528.6	69.12	15 56.3	58 23.8	II. N.
5	19 40.81	2.096	22 33 42.75	135.94	12 29 46.4	640.2	67.06	15 46.3	57 47.1	II. N.
6	20 29.73	1.986	23 26 42.58	129.38	7 58 52.6	707.3	65.32	15 36.6	57 11.5	II. N.
7	21 16.43	1.911	0 17 28.93	124.85	-3 9 14.1	734.7	64.07	15 27.4	56 37.7	II. N.
8	22 1.74	1.871	1 6 51.87	122.41	+1 44 18.7	727.4	63.36	15 18.8	56 6.0	II. N.
9	22 46.48	1.862	1 55 39.94	121.89	+6 28 32.0	+688.6	63.18	15 10.8	55 36.7	II. N.
10	23 31.33	1.879	2 44 34.93	122.92	10 51 22.9	620.9	63.43	15 3.6	55 10.1	
12	0 16.82	1.914	3 34 8.32	125.00	14 41 45.6	526.8	64.00	14 57.2	54 46.7	
13	1 3.25	1.956	4 24 38.27	127.52	17 49 39.5	409.1	64.66	14 51.8	54 27.2	I. N.
14	1 50.66	1.994	5 16 7.16	129.80	20 6 34.1	272.7	65.31	14 47.9	54 13.0	I. N.
15	2 38.83	2.018	6 8 21.81	131.23	+21 26 4.0	+123.3	65.75	14 45.7	54 4.9	I. N.
16	3 27.35	2.022	7 0 57.34	131.50	21 44 25.8	-31.8	65.89	14 45.7	54 4.6	I. N.
17	4 15.73	2.007	7 53 24.83	130.61	21 0 52.2	185.1	65.73	14 48.1	54 13.3	I. N.
18	5 3.58	1.980	8 45 20.58	128.95	+19 17 22.0	-330.6	65.34	14 53.1	54 31.8	I. N.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	"	"	
May 19	5 50.73	1.950	9 36 33.70	127.17	+ 16 38 5.1	- 463.4	64.90	15 0.9	55 0.5	I. N.
20	6 37.26	1.930	10 27 9.78	125.99	13 8 50.8	579.9	64.59	15 11.5	55 39.4	I. N.
21	7 23.55	1.931	11 17 31.20	126.06	8 56 48.1	676.7	64.58	15 24.6	56 27.2	I. N.
22	8 10.21	1.962	12 8 14.88	127.91	+ 4 10 42.1	749.1	65.62	15 39.4	57 21.8	I. N.
23	8 58.04	2.030	13 0 8.92	131.97	- 0 58 18.1	789.7	66.02	15 55.2	58 19.8	I. N.
24	9 47.94	2.135	13 54 7.96	138.33	- 6 15 26.0	- 787.9	67.61	16 10.7	59 16.3	I. N.
25	10 40.80	2.274	14 51 5.04	146.70	11 21 21.5	731.4	69.67	16 24.0	60 5.5	I. N.
26	11 37.14	2.429	15 51 37.07	155.98	15 51 51.7	609.6	71.90	16 34.3	60 42.1	I. N.
27	12 37.24	2.564	16 55 43.23	164.11	19 20 13.5	421.8	73.82	16 39.4	61 1.0	II. N. S.
28	13 39.81	2.637	18 2 24.50	168.48	21 22 35.3	- 183.9	74.87	16 39.0	61 0.3	II. N.
29	14 43.04	2.616	19 9 45.27	167.25	- 21 45 4.4	+ 71.1	74.64	16 33.6	60 40.9	II. N.
30	15 44.68	2.508	20 15 30.38	160.76	20 28 34.1	305.2	73.17	16 24.2	60 7.5	II. N.
31	16 43.02	2.349	21 17 57.09	151.19	17 47 17.7	491.9	70.92	16 12.1	59 21.9	II. N.
June 1	17 37.38	2.182	22 16 23.71	141.14	14 2 33.0	622.4	68.47	15 58.8	58 32.8	II. N.
2	18 27.96	2.038	23 11 3.37	132.49	9 36 19.8	700.6	66.28	15 45.3	57 43.4	II. N.
3	19 15.52	1.932	0 2 41.58	126.11	- 4 47 53.8	+ 734.9	64.58	15 32.6	56 56.8	II. N.
4	20 1.03	1.867	0 52 16.45	122.21	+ 0 6 56.9	733.7	63.50	15 21.2	56 15.0	II. N.
5	20 45.47	1.841	1 40 46.37	120.65	4 55 9.6	702.4	63.03	15 11.4	55 38.7	II. N.
6	21 29.69	1.848	2 29 3.50	121.07	9 25 25.9	644.4	63.08	15 3.1	55 8.2	II. N.
7	22 14.40	1.880	3 17 49.91	123.00	13 27 22.2	561.1	63.53	14 56.3	54 43.4	II. N.
8	23 0.07	1.926	4 7 33.96	125.76	+ 16 51 9.4	+ 454.0	64.23	14 51.0	54 23.9	
9	23 46.88	1.974	4 58 27.22	128.63	19 27 43.1	325.6	64.97	14 47.2	54 9.7	
11	0 34.73	2.010	5 50 22.43	130.80	21 9 24.0	180.6	65.53	14 44.8	54 0.9	
12	1 23.20	2.025	6 42 55.41	131.69	21 50 55.4	+ 26.0	65.80	14 43.8	53 57.7	I. N.
13	2 11.74	2.015	7 35 31.85	131.09	21 30 7.2	- 129.5	65.71	14 44.6	54 0.9	I. N.
14	2 59.76	1.984	8 27 37.80	129.23	+ 20 8 13.7	- 278.1	65.29	14 47.4	54 11.1	I. N.
15	3 46.90	1.943	9 18 50.38	126.78	17 49 24.6	413.3	64.71	14 52.5	54 29.5	I. N.
16	4 33.06	1.906	10 9 4.47	124.50	14 39 53.5	531.1	64.16	14 59.9	54 56.6	I. N.
17	5 18.49	1.884	10 58 34.33	123.20	10 47 6.8	629.2	63.85	15 9.7	55 32.6	I. N.
18	6 3.72	1.890	11 47 51.74	123.57	6 19 23.3	705.5	63.96	15 21.9	56 17.4	I. N.
19	6 49.50	1.932	12 37 42.72	126.09	+ 1 26 2.6	- 756.4	64.62	15 36.2	57 9.9	I. N.
20	7 36.78	2.015	13 29 3.97	131.12	- 3 41 30.4	775.3	65.91	15 51.9	58 7.5	I. N.
21	8 26.60	2.143	14 22 57.74	138.77	8 48 34.8	752.0	67.81	16 7.9	59 6.5	I. N.
22	9 19.92	2.305	15 20 22.59	148.58	13 35 49.1	673.8	70.20	16 22.9	60 1.5	I. N.
23	10 17.38	2.481	16 21 55.70	159.12	17 38 54.4	530.0	72.69	16 35.2	60 46.4	I. N.
24	11 18.78	2.626	17 27 26.56	167.87	- 20 30 59.4	- 320.3	74.72	16 43.0	61 15.0	I. N.
25	12 22.81	2.692	18 35 35.14	171.82	21 48 57.8	- 64.7	75.63	16 45.3	61 23.2	II. N. S.
26	13 27.12	2.649	19 44 1.00	169.24	21 21 50.7	+ 197.7	75.07	16 41.6	61 9.3	II. N.
27	14 29.24	2.515	20 50 14.85	161.19	19 15 29.2	425.5	73.22	16 32.5	60 36.6	II. N.
28	15 27.51	2.338	21 52 37.38	150.50	15 49 30.4	593.5	70.71	16 19.5	59 49.0	II. N.
29	16 21.48	2.163	22 50 40.86	140.00	- 11 29 14.3	+ 697.6	68.15	16 4.3	58 53.6	II. N.
30	17 11.60	2.020	23 44 52.86	131.40	6 38 45.8	746.5	66.00	15 48.7	57 55.9	II. N.
July 1	17 58.80	1.920	0 36 9.09	125.40	- 1 37 47.2	752.1	64.45	15 33.8	57 0.9	II. N.
2	18 44.13	1.864	1 25 33.14	122.03	+ 3 18 27.5	+ 724.2	63.52	15 20.1	56 11.1	II. N.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
July 3	19 28.60	1.848	2 14 5.47	121.03	+ 7 58 1.7	+ 669.5	63.24	15 8.8	55 29.3	II. N.
4	20 13.08	1.863	3 2 37.98	121.96	12 10 54.5	591.2	63.43	14 59.6	54 55.5	II. N.
5	20 58.22	1.901	3 51 50.22	124.23	15 48 1.5	490.8	63.08	14 52.6	54 29.8	II. N.
6	21 44.41	1.949	4 42 6.05	127.12	18 40 50.1	369.9	64.68	14 47.7	54 11.9	II. N.
7	22 31.75	1.994	5 33 30.43	129.81	20 41 33.7	231.1	65.33	14 44.7	54 1.0	II. N.
8	23 19.98	2.022	6 25 48.59	131.49	+ 21 43 58.8	+ 79.4	65.72	14 43.5	53 56.5	
10	0 8.59	2.085	7 18 29.88	131.67	21 44 26.9	- 77.2	65.77	14 44.0	53 58.1	
11	0 56.96	2.002	8 10 56.81	130.33	20 42 41.5	230.1	65.43	14 46.0	54 5.4	
12	1 44.55	1.961	9 2 36.66	127.86	18 41 55.4	371.1	64.82	14 49.4	54 18.3	I. N.
13	2 31.06	1.914	9 53 11.47	125.05	15 48 13.4	494.0	64.14	14 54.6	54 37.2	I. N.
14	3 16.52	1.876	10 42 42.75	122.71	+ 12 9 34.2	- 595.4	63.58	15 1.6	55 2.6	I. N.
15	4 1.26	1.857	11 31 31.38	121.61	7 54 56.7	673.6	63.35	15 10.4	55 34.9	I. N.
16	4 45.92	1.870	12 20 14.66	122.36	+ 3 14 1.0	726.8	63.59	15 21.0	56 14.2	I. N.
17	5 31.32	1.920	13 9 42.71	125.40	- 1 42 47.6	752.1	64.43	15 33.5	57 0.1	I. N.
18	6 18.45	2.014	14 0 54.65	131.04	6 43 11.5	743.7	65.91	15 47.5	57 51.2	I. N.
19	7 8.34	2.151	14 54 53.16	139.24	- 11 32 4.8	- 692.7	67.99	16 2.1	58 44.9	I. N.
20	8 1.93	2.319	15 52 33.88	149.37	15 50 18.2	588.5	70.47	16 16.4	59 37.6	I. N.
21	8 59.71	2.493	16 54 26.37	159.86	19 14 41.0	422.8	72.93	16 29.0	60 23.7	I. N.
22	10 1.29	2.628	18 0 8.07	167.97	21 20 44.6	- 199.0	74.79	16 38.3	60 57.7	I. N. S.
23	11 5.16	2.677	19 8 7.41	170.93	21 49 5.6	+ 60.1	75.44	16 42.9	61 14.3	I. N. S.
24	12 8.95	2.621	20 16 1.54	167.56	- 20 33 12.3	+ 315.1	74.64	16 41.8	61 10.2	II. N. S.
25	13 10.33	2.484	21 21 31.34	155.32	17 42 55.2	526.6	72.72	16 35.0	60 45.7	II. N.
26	14 7.93	2.314	22 23 13.00	149.06	13 40 32.9	673.7	70.28	16 23.6	60 3.7	II. N.
27	15 1.47	2.152	23 20 50.71	139.34	8 52 52.3	754.2	67.91	16 9.0	59 10.4	II. N.
28	15 51.49	2.024	0 14 57.14	131.60	- 3 44 39.7	778.4	66.00	15 53.0	58 11.7	II. N.
29	16 38.94	1.937	1 6 28.06	126.39	+ 1 24 8.3	+ 759.2	64.68	15 37.1	57 13.2	II. N.
30	17 24.81	1.892	1 56 24.36	123.69	6 18 25.8	707.4	63.99	15 22.4	56 19.3	II. N.
31	18 10.04	1.883	2 45 42.24	123.14	10 46 41.1	630.0	63.56	15 9.8	55 33.0	II. N.
Aug. 1	18 55.41	1.902	3 35 8.28	124.27	14 39 37.0	531.3	64.14	14 59.7	54 55.8	II. N.
2	19 41.46	1.938	4 25 15.57	126.45	17 49 9.6	413.4	64.68	14 52.2	54 28.4	II. N.
3	20 28.47	1.979	5 16 20.60	128.94	+ 20 8 4.8	+ 278.6	65.27	14 47.4	54 10.6	II. N.
4	21 16.41	2.013	6 8 21.17	130.96	21 30 13.8	+ 130.3	65.73	14 44.9	54 1.9	II. N.
5	22 4.94	2.027	7 0 57.37	131.82	21 51 16.2	- 25.8	65.89	14 44.9	54 1.2	II. S.
6	22 53.53	2.018	7 53 37.42	131.26	21 9 35.3	181.9	65.69	14 46.6	54 7.6	II. S.
7	23 41.62	1.987	8 45 47.52	129.40	19 26 51.7	329.6	65.17	14 49.8	54 19.7	
9	0 28.80	1.943	9 37 2.47	126.78	+ 16 48 2.2	- 461.3	64.49	14 54.5	54 36.8	
10	1 14.90	1.900	10 27 12.97	124.17	13 20 41.6	571.4	63.82	15 0.4	54 58.5	I. N.
11	2 0.09	1.869	11 16 28.21	122.30	9 14 12.0	656.6	63.37	15 7.4	55 24.1	I. N.
12	2 44.80	1.861	12 5 14.28	121.84	+ 4 39 1.6	714.6	63.31	15 15.5	55 53.7	I. N.
13	3 29.68	1.885	12 54 11.17	123.27	- 0 13 34.5	743.3	63.76	15 24.7	56 27.3	I. N.
14	4 15.57	1.946	13 44 8.97	126.95	- 5 11 22.1	- 739.9	64.78	15 34.8	57 4.6	I. N.
15	5 3.41	2.047	14 36 3.54	132.99	10 0 32.4	699.2	66.40	15 45.8	57 45.4	I. N.
16	5 54.10	2.182	15 30 49.69	141.15	14 24 52.7	614.5	68.49	15 57.4	58 28.1	I. N.
17	6 48.33	2.338	16 29 9.11	150.54	- 18 5 20.6	- 478.8	70.80	16 9.0	59 10.4	I. N.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian	Geocentric Semi- diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	"	"	
Aug. 18	7 46.27	2.485	17 31 11.62	159.38	- 20 40 53.1	- 890.3	72.89	16 19.6	59 49.0	I. N.
19	8 47.23	2.583	18 36 15.72	165.26	21 51 44.6	- 58.3	74.21	16 27.8	60 19.5	I. N. S.
20	9 49.60	2.599	19 42 44.48	166.22	21 25 7.9	+ 191.7	74.39	16 32.8	60 37.8	I. S.
21	10 51.29	2.529	20 48 32.91	162.04	19 20 40.7	424.9	73.35	16 33.4	60 39.9	I. S.
22	11 50.55	2.402	21 51 54.51	151.37	15 51 39.9	610.4	71.51	16 29.4	60 24.7	I. S.
23	12 46.45	2.257	22 51 54.65	145.64	- 11 20 49.8	+ 732.7	69.38	16 20.7	59 53.2	II. N. S.
24	13 38.99	2.125	23 48 32.22	137.75	6 13 58.9	791.4	67.43	16 8.6	59 8.5	II. N.
25	14 28.73	2.025	0 42 21.47	131.70	- 0 55 0.7	795.2	65.94	15 54.3	58 15.8	II. N.
26	15 16.51	1.962	1 34 12.45	127.90	+ 4 16 25.7	755.7	65.02	15 39.2	57 20.6	II. N.
27	16 3.19	1.933	2 24 57.17	126.16	9 5 7.7	683.0	64.61	15 24.6	56 27.6	II. N.
28	16 49.53	1.933	3 15 21.90	126.15	+ 13 19 27.9	+ 584.9	64.66	15 11.8	55 40.5	II. N.
29	17 36.13	1.953	4 6 2.28	127.37	16 50 22.1	466.6	65.01	15 1.4	55 1.9	II. N.
30	18 23.36	1.983	4 57 20.00	129.15	19 30 32.0	331.9	65.47	14 53.6	54 33.5	II. N.
31	19 11.30	2.011	5 49 20.74	130.84	21 14 6.0	183.7	65.87	14 48.7	54 15.7	II. N.
Sept. 1	19 59.78	2.026	6 41 54.19	131.78	21 56 48.0	+ 28.4	66.07	14 46.8	54 8.5	II. S.
2	20 48.43	2.024	7 34 37.73	131.63	+ 21 36 35.2	- 129.3	65.96	14 47.4	54 11.0	II. S.
3	21 36.78	2.003	8 27 3.62	130.34	20 14 1.3	282.1	65.55	14 50.4	54 22.0	II. S.
4	22 24.45	1.968	9 18 47.96	128.26	17 52 34.9	422.5	64.96	14 55.4	54 40.0	II. S.
5	23 11.22	1.930	10 9 38.30	125.96	14 38 29.0	544.3	64.31	15 1.8	55 3.4	
6	23 57.13	1.899	10 59 37.33	124.10	10 40 15.9	642.3	63.80	15 9.1	55 30.4	
8	0 42.50	1.885	11 49 3.29	123.29	+ 6 8 18.0	- 712.5	63.60	15 17.1	55 59.6	
9	1 27.84	1.898	12 38 27.64	124.04	+ 1 14 26.0	751.3	63.83	15 25.4	56 30.0	I. N.
10	2 13.84	1.941	13 28 31.67	126.64	- 3 48 7.5	755.3	64.57	15 33.6	57 0.7	I. N.
11	3 1.28	2.018	14 20 2.69	131.28	8 44 45.3	720.9	65.85	15 41.9	57 31.1	I. N.
12	3 50.96	2.126	15 13 47.89	137.78	13 19 11.3	643.8	67.59	15 50.2	58 0.9	I. N.
13	4 43.49	2.254	16 10 25.33	145.46	- 17 13 31.2	- 519.9	69.57	15 58.0	58 29.7	I. N.
14	5 39.15	2.381	17 10 10.34	153.14	20 8 52.4	349.2	71.46	16 5.3	58 56.8	I. N.
15	6 37.55	2.479	18 12 40.71	158.93	21 47 29.8	- 138.3	72.85	16 11.8	59 20.6	I. S.
16	7 37.61	2.515	19 16 50.44	161.19	21 56 25.2	+ 95.5	73.37	16 16.8	59 38.9	I. S.
17	8 37.72	2.482	20 21 3.56	159.22	20 31 31.4	326.1	72.83	16 19.7	59 49.6	I. S.
18	9 36.33	2.394	21 23 46.24	153.89	- 17 39 34.9	+ 526.7	71.49	16 19.9	59 50.0	I. S.
19	10 32.42	2.278	22 23 57.48	146.92	13 36 50.4	677.8	69.73	16 16.8	59 38.5	I. S.
20	11 25.70	2.164	23 21 19.84	140.07	8 45 5.7	771.1	68.00	16 10.3	59 15.0	I. S.
21	12 16.48	2.072	0 16 11.30	134.49	- 3 27 30.3	807.7	66.58	16 1.0	58 40.6	II. N. S.
22	13 5.38	2.009	1 9 9.81	130.71	+ 1 54 21.2	793.7	65.63	15 49.4	57 58.2	II. N. S.
23	13 53.13	1.976	2 0 59.66	128.75	+ 7 1 56.9	+ 737.9	65.17	15 36.7	57 11.6	II. N.
24	14 40.44	1.970	2 52 22.41	128.38	11 40 11.3	648.4	65.14	15 24.0	56 24.7	II. N.
25	15 27.84	1.983	3 43 50.86	129.13	15 37 9.8	532.6	65.41	15 12.2	55 41.4	II. N.
26	16 15.68	2.004	4 35 45.36	130.44	18 43 42.2	397.2	65.81	15 2.2	55 4.9	II. N.
27	17 4.04	2.025	5 28 11.63	131.67	20 53 3.1	247.6	66.17	14 54.6	54 37.2	II. N.
28	17 52.79	2.035	6 21 1.12	132.30	+ 22 0 45.2	+ 90.0	66.34	14 49.9	54 20.1	II. S.
29	18 41.60	2.029	7 13 54.42	131.97	22 4 42.6	- 70.0	66.25	14 48.3	54 14.1	II. S.
30	19 30.08	2.008	8 6 27.91	130.68	21 5 17.3	226.0	65.88	14 49.7	54 18.9	II. S.
Oct. 1	20 17.91	1.976	8 58 21.54	128.72	+ 19 5 14.8	- 372.1	65.30	14 53.7	54 34.0	II. S.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	"	"	
Oct. 2	21 4-90	1.940	9 49 25.27	126.62	+ 16 9 35.7	- 503.2	64.67	15 0.1	54 57.8	II. S.
3	21 51.12	1.913	10 39 42.62	124.96	12 25 20.0	614.4	64.17	15 8.5	55 28.6	II. S.
4	22 36.86	1.902	11 29 31.00	124.30	8 1 21.3	701.0	63.93	15 18.0	56 3.5	II. S.
5	23 22.60	1.915	12 19 19.98	125.07	+ 3 8 29.2	757.9	64.12	15 28.1	56 40.5	
7	0 9.01	1.953	13 9 48.31	127.60	- 2 0 18.4	779.6	64.79	15 38.1	57 16.6	
8	0 56.79	2.030	14 1 39.94	132.02	- 7 9 45.1	- 760.2	65.97	15 47.1	57 49.7	
9	1 46.69	2.132	14 55 38.43	138.11	12 2 14.5	694.2	67.58	15 54.7	58 17.9	I. N.
10	2 39.26	2.251	15 52 17.77	145.25	16 18 15.0	577.5	69.43	16 0.8	58 40.5	I. N.
11	3 34.70	2.367	16 51 50.17	152.24	19 37 38.2	411.6	71.19	16 5.3	58 57.2	I. N.
12	4 32.62	2.452	17 53 51.15	157.38	21 42 5.7	- 205.1	72.49	16 8.3	59 8.0	I. N.
13	5 31.97	2.482	18 57 18.41	159.21	- 22 18 36.4	+ 24.4	72.98	16 9.9	59 13.5	I. S.
14	6 31.26	2.448	20 0 42.07	157.13	21 22 45.7	252.5	72.49	16 10.1	59 14.2	I. S.
15	7 29.05	2.362	21 2 35.75	151.93	18 59 58.4	455.6	71.20	16 8.8	59 9.7	I. S.
16	8 24.42	2.251	22 2 3.73	145.27	15 23 52.1	617.0	69.51	16 6.1	58 59.8	I. S.
17	9 17.12	2.143	22 58 50.90	138.78	10 52 57.6	728.9	67.81	16 1.8	58 43.9	I. S.
18	10 7.45	2.056	23 53 15.51	133.54	- 5 47 30.2	+ 790.0	66.42	15 55.7	58 21.5	I. S.
19	10 56.04	1.998	0 45 55.29	130.10	- 0 27 23.9	802.7	65.48	15 47.9	57 53.2	I. S.
20	11 43.62	1.972	1 37 34.71	128.48	+ 4 48 51.7	771.6	65.05	15 38.8	57 19.7	I. II. S.
21	12 30.90	1.972	2 28 55.85	128.51	9 44 44.2	701.8	65.08	15 28.9	56 43.0	II. N. S.
22	13 18.44	1.991	3 20 32.12	129.65	14 5 51.9	598.9	65.41	15 18.6	56 5.3	II. N.
23	14 6.55	2.019	4 12 43.57	131.32	+ 17 40 19.6	+ 469.5	65.90	15 8.8	55 29.4	II. N.
24	14 55.32	2.043	5 5 34.01	132.79	20 18 55.0	320.8	66.37	15 0.4	54 58.2	II. N.
25	15 44.53	2.054	5 58 51.09	133.45	21 55 24.9	+ 160.5	66.61	14 53.6	54 33.9	II. N. S.
26	16 33.77	2.046	6 52 10.40	132.94	22 26 47.4	- 3.4	66.51	14 49.5	54 18.7	II. S.
27	17 22.57	2.018	7 45 3.22	131.28	21 53 14.2	163.2	66.14	14 48.2	54 13.7	II. S.
28	18 10.54	1.978	8 37 5.89	128.86	+ 20 17 30.4	- 313.3	65.52	14 49.9	54 20.1	II. S.
29	18 57.50	1.935	9 28 7.24	126.27	17 44 28.8	449.2	64.81	14 54.6	54 37.2	II. S.
30	19 43.49	1.900	10 18 11.21	124.20	14 20 29.3	567.7	64.22	15 2.2	55 4.9	II. S.
31	20 28.89	1.884	11 7 37.62	123.24	10 12 59.7	666.1	63.90	15 12.1	55 41.5	II. S.
Nov. 1	21 14.16	1.895	11 56 59.28	123.87	5 30 47.0	740.4	64.01	15 23.9	56 24.7	II. S.
2	22 0.09	1.938	12 46 59.02	126.45	+ 0 24 33.1	- 785.1	64.63	15 36.6	57 11.3	II. S.
3	22 47.47	2.016	13 38 26.06	131.15	- 4 52 15.8	791.9	65.82	15 49.1	57 57.5	II. S.
4	23 37.13	2.127	14 32 10.64	137.88	10 2 43.4	751.7	67.53	16 0.5	58 39.2	
6	0 29.78	2.262	15 28 54.92	145.97	14 46 13.9	656.0	69.57	16 9.8	59 12.9	
7	1 25.74	2.399	16 28 58.32	154.17	18 39 37.7	501.3	71.62	16 16.0	59 36.0	I. N.
8	2 24.67	2.503	17 32 0.01	160.46	- 21 20 16.0	- 294.4	73.18	16 18.9	59 46.5	I. N.
9	3 25.38	2.543	18 36 49.20	162.86	22 30 51.0	- 55.4	73.81	16 18.6	59 45.6	I. S.
10	4 26.10	2.503	19 41 38.88	160.50	22 4 16.8	+ 186.0	73.32	16 15.7	59 35.0	I. S.
11	5 25.05	2.401	20 44 42.53	154.29	20 5 30.5	401.5	71.87	16 10.8	59 17.0	I. S.
12	6 21.10	2.267	21 44 50.97	146.27	16 49 2.2	572.7	69.90	16 4.5	58 53.9	I. S.
13	7 13.92	2.137	22 41 45.66	138.45	- 12 34 10.1	+ 693.2	67.92	15 57.5	58 28.3	I. S.
14	8 3.90	2.033	23 35 48.89	132.15	7 40 57.4	764.9	66.25	15 50.0	58 0.7	I. S.
15	8 51.78	1.963	0 27 45.96	127.98	- 2 28 6.8	792.1	65.11	15 42.3	57 32.1	I. S.
16	9 38.44	1.931	1 18 30.05	126.05	+ 2 47 25.6	+ 779.1	64.54	15 34.2	57 2.6	I. S.



## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi- diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Nov. 17	10 24.74	1.932	2 8 52.34	126.11	+ 7 50 15.4	+ 729.1	64.50	15 26.0	56 32.7	I. S.
18	11 11.39	1.958	2 59 35.20	127.67	12 26 11.8	645.2	64.84	15 17.9	56 2.6	I. S.
19	11 58.84	1.998	3 51 7.04	130.07	16 22 19.6	530.7	65.51	15 9.9	55 33.2	I. II. N. S.
20	12 47.28	2.038	4 43 37.98	132.45	19 27 25.9	391.1	66.15	15 2.3	55 5.6	II. N. S.
21	13 36.54	2.063	5 36 58.02	134.01	21 32 48.2	233.4	66.59	14 55.7	54 41.6	II. N. S.
22	14 26.13	2.065	6 30 38.44	134.10	+ 22 33 4.6	+ 67.3	66.68	14 50.6	54 22.8	II. S.
23	15 15.44	2.040	7 24 1.36	132.57	22 26 49.7	- 97.6	66.36	14 47.4	54 10.9	II. S.
24	16 3.87	1.993	8 16 31.35	129.77	21 16 18.4	252.8	65.71	14 46.5	54 7.7	II. S.
25	16 51.03	1.937	9 7 45.63	126.39	19 6 36.4	392.8	64.88	14 48.3	54 14.2	II. S.
26	17 36.88	1.885	9 57 40.57	123.29	16 4 29.9	514.6	64.08	14 53.0	54 31.5	II. S.
27	18 21.67	1.851	10 46 31.91	121.22	+ 12 17 30.5	- 617.0	63.52	15 0.7	54 59.7	II. S.
28	19 5.94	1.844	11 34 52.00	120.78	7 53 34.2	699.0	63.38	15 11.2	55 38.2	II. S.
29	19 50.45	1.872	12 23 26.20	122.46	+ 3 1 20.6	757.8	63.79	15 24.0	56 25.6	II. S.
30	20 36.10	1.940	13 13 9.26	126.56	- 2 8 52.2	787.7	64.82	15 38.6	57 19.2	II. S.
Dec. 1	21 23.90	2.050	14 5 1.59	133.22	7 23 48.5	779.6	66.50	15 53.9	58 15.2	II. S.
2	22 14.83	2.199	15 0 2.57	142.19	- 12 25 54.0	- 721.3	68.73	16 8.5	59 8.4	II. S.
3	23 9.65	2.370	15 58 57.19	152.44	16 52 39.3	601.3	71.22	16 20.8	59 53.8	
5	0 8.50	2.528	17 1 54.51	161.98	20 18 7.2	415.3	73.51	16 29.6	60 25.7	
6	1 10.54	2.628	18 8 3.68	167.95	22 17 35.4	- 175.1	74.95	16 33.6	60 40.8	I. S.
7	2 13.86	2.631	19 15 29.84	168.16	22 35 3.2	+ 88.2	75.01	16 32.9	60 37.9	I. S.
8	3 16.06	2.538	20 21 48.84	162.57	- 21 9 14.3	+ 335.0	73.79	16 27.7	60 18.9	I. S.
9	4 15.22	2.385	21 25 4.63	153.38	18 13 33.3	533.9	71.65	16 19.2	59 47.5	I. S.
10	5 10.47	2.220	22 24 25.47	143.44	14 10 3.1	673.4	69.25	16 8.5	59 8.4	I. S.
11	6 1.98	2.078	23 20 0.75	134.85	9 22 27.3	755.6	67.09	15 56.9	58 25.9	I. S.
12	6 50.51	1.974	0 12 37.21	128.63	- 4 11 58.5	789.3	65.45	15 45.3	57 43.5	I. S.
13	7 37.09	1.915	1 3 16.32	125.07	+ 1 3 41.3	+ 782.8	64.47	15 34.4	57 3.4	I. S.
14	8 22.76	1.897	1 53 0.12	123.97	6 9 45.5	742.1	64.12	15 24.4	56 26.8	I. S.
15	9 8.41	1.912	2 42 43.26	124.93	10 53 18.9	670.6	64.31	15 15.5	55 54.0	I. S.
16	9 54.74	1.952	3 33 7.63	127.28	15 2 28.6	570.4	64.88	15 7.6	55 25.1	I. S.
17	10 42.17	2.001	4 24 37.59	130.22	18 26 12.8	444.0	65.59	15 0.8	55 0.0	I. S.
18	11 30.73	2.043	5 17 15.63	132.79	+ 20 54 49.4	+ 295.8	66.23	14 55.0	54 38.7	I. N. S.
19	12 20.08	2.065	6 10 41.52	134.08	22 20 58.5	+ 133.3	66.56	14 50.2	54 21.4	II. N. S.
20	13 9.60	2.056	7 4 17.09	133.55	22 40 50.6	- 33.8	66.44	14 46.8	54 8.7	II. N. S.
21	13 58.53	2.017	7 57 17.64	131.21	21 54 46.9	194.7	65.90	14 44.9	54 1.6	II. S.
22	14 46.26	1.958	8 49 6.02	127.66	20 6 59.3	341.3	65.04	14 44.8	54 1.1	II. S.
23	15 32.48	1.893	9 39 23.12	123.78	+ 17 24 25.3	- 468.1	64.08	14 46.8	54 8.3	II. S.
24	16 17.23	1.838	10 28 11.93	120.47	13 55 24.0	573.4	63.27	14 51.2	54 24.6	II. S.
25	17 0.90	1.806	11 15 55.87	118.48	9 48 35.0	657.0	62.78	14 58.3	54 50.5	II. S.
26	17 44.15	1.805	12 3 14.54	118.44	5 12 35.7	719.1	62.79	15 8.0	55 26.4	II. S.
27	18 27.84	1.844	12 51 0.10	120.79	+ 0 16 24.4	757.6	63.42	15 20.4	56 12.0	II. S.
28	19 13.01	1.928	13 40 13.80	125.83	- 4 49 42.6	- 767.6	64.75	15 35.1	57 5.8	II. S.
29	20 0.75	2.059	14 32 2.63	133.70	9 52 42.4	740.2	66.76	15 51.2	58 5.0	II. S.
30	20 52.15	2.231	15 27 31.67	144.07	14 35 11.1	662.7	69.32	16 7.6	59 5.4	II. S.
31	21 48.10	2.424	16 27 28.33	155.70	- 18 34 31.0	- 523.0	72.12	16 22.8	60 1.1	II. S.

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	22 45.4	17 26 0.51	-22 52 16.2	7.0	2.7	0.19	Feb. 16	0 58.1	22 40 25.58	-9 34 50.6	7.1	2.7	0.18
1	22 47.7	17 32 12.05	23 4 38.9	6.9	2.7	0.19	17	1 0.7	22 47 0.22	8 45 45.1	7.2	2.7	0.18
2	22 50.0	17 38 27.78	23 16 1.2	6.8	2.6	0.19	18	1 3.2	22 53 28.46	7 56 2.0	7.3	2.8	0.19
3	22 52.4	17 44 47.41	23 26 20.8	6.7	2.6	0.19	19	1 5.6	22 59 49.20	7 5 53.2	7.4	2.8	0.19
4	22 54.8	17 51 10.66	23 35 35.3	6.7	2.5	0.19	20	1 7.9	23 6 1.12	6 15 30.4	7.5	2.9	0.19
5	22 57.3	17 57 37.31	-23 43 42.5	6.6	2.5	0.19	21	1 10.0	23 12 2.88	-5 25 8.4	7.7	2.9	0.20
6	22 59.8	18 4 7.16	23 50 40.7	6.6	2.5	0.19	22	1 11.8	23 17 52.85	4 35 2.6	7.8	3.0	0.20
7	23 2.4	18 10 39.97	23 56 28.0	6.6	2.5	0.18	23	1 13.5	23 23 29.35	3 45 30.6	8.0	3.0	0.21
8	23 5.1	18 17 15.58	24 1 2.5	6.5	2.5	0.18	24	1 14.9	23 28 50.62	2 56 50.8	8.2	3.1	0.21
9	23 7.8	18 23 53.78	24 4 22.7	6.5	2.5	0.18	25	1 16.0	23 33 54.66	2 9 23.5	8.4	3.2	0.21
10	23 10.5	18 30 34.40	-24 6 27.5	6.5	2.5	0.18	26	1 16.8	23 38 39.45	-1 23 29.4	8.6	3.3	0.22
11	23 13.2	18 37 17.29	24 7 15.8	6.4	2.5	0.18	27	1 17.3	23 43 3.11	-0 39 29.7	8.9	3.4	0.22
12	23 16.0	18 44 2.30	24 6 45.5	6.4	2.4	0.18	28	1 17.4	23 47 3.64	+0 2 13.9	9.1	3.5	0.23
13	23 18.9	18 50 49.28	24 4 55.6	6.3	2.4	0.18	Mar. 1	1 17.0	23 50 39.12	0 41 19.7	9.4	3.6	0.24
14	23 21.8	18 57 38.11	24 1 45.1	6.3	2.4	0.18	2	1 16.2	23 53 47.82	1 17 27.0	9.7	3.7	0.24
15	23 24.7	19 4 28.65	-23 57 13.0	6.3	2.4	0.17	3	1 14.9	23 56 28.19	+1 50 15.0	10.0	3.8	0.25
16	23 27.6	19 11 20.71	23 51 18.3	6.3	2.4	0.17	4	1 13.2	23 58 38.87	2 19 24.4	10.3	3.9	0.26
17	23 30.6	19 18 14.24	23 44 0.0	6.2	2.4	0.17	5	1 10.9	0 0 18.83	2 44 40.1	10.6	4.0	0.27
18	23 33.6	19 25 9.10	23 35 17.2	6.2	2.4	0.17	6	1 8.1	0 1 27.40	3 5 45.0	11.0	4.2	0.28
19	23 36.6	19 32 5.18	23 25 9.0	6.2	2.4	0.17	7	1 4.8	0 2 4.23	3 22 25.8	11.3	4.3	0.28
20	23 39.6	19 39 2.34	-23 13 34.6	6.2	2.4	0.17	8	1 1.0	0 2 9.55	+3 34 32.8	11.6	4.4	0.29
21	23 42.6	19 46 0.53	23 0 33.3	6.2	2.4	0.17	9	0 56.6	0 1 44.00	3 41 58.7	12.0	4.5	0.30
22	23 45.6	19 52 59.65	22 46 4.3	6.2	2.4	0.17	10	0 51.7	0 0 48.75	3 44 41.0	12.3	4.6	0.31
23	23 48.6	19 59 59.59	22 30 7.0	6.2	2.4	0.17	11	0 46.4	23 59 25.54	3 42 40.0	12.7	4.8	0.32
24	23 51.6	20 7 0.25	22 12 40.9	6.2	2.4	0.17	12	0 40.7	23 57 36.61	3 36 1.3	13.0	4.9	0.33
25	23 54.6	20 14 1.54	-21 53 45.3	6.2	2.4	0.17	13	0 34.6	23 55 24.80	+3 24 56.3	13.3	5.0	0.33
26	23 57.7	20 21 3.39	21 33 19.7	6.2	2.4	0.17	14	0 28.1	23 52 53.39	3 9 40.0	13.6	5.1	0.34
28	0 0.8	20 28 5.69	21 11 23.7	6.2	2.4	0.16	15	0 21.5	23 50 6.08	2 50 33.6	13.9	5.2	0.34
29	0 3.9	20 35 8.35	20 47 56.8	6.2	2.4	0.16	16	0 14.5	23 47 6.80	2 28 3.3	14.1	5.3	0.35
30	0 7.0	20 42 11.31	20 22 58.9	6.2	2.4	0.16	17	0 7.5	23 43 59.79	2 2 37.6	14.3	5.4	0.35
31	0 10.1	20 49 14.47	-19 56 29.6	6.2	2.4	0.16	18	0 0.4	23 40 49.33	+1 34 49.3	14.4	5.4	0.36
Feb. 1	0 13.2	20 56 17.73	19 28 28.8	6.2	2.4	0.16	18	23 53.3	23 37 39.51	1 5 14.9	14.5	5.5	0.36
2	0 16.3	21 3 20.98	18 58 56.5	6.3	2.4	0.16	19	23 46.3	23 34 34.32	0 34 30.0	14.6	5.5	0.37
3	0 19.4	21 10 24.12	18 27 52.9	6.3	2.4	0.17	20	23 39.4	23 31 37.41	+0 3 8.9	14.6	5.5	0.37
4	0 22.5	21 17 27.05	17 55 18.2	6.3	2.4	0.17	21	23 32.7	23 28 52.00	-0 28 14.5	14.5	5.5	0.37
5	0 25.6	21 24 29.63	-17 21 12.9	6.3	2.4	0.17	22	23 26.3	23 26 20.89	-0 59 8.4	14.4	5.5	0.37
6	0 28.7	21 31 31.71	16 45 37.9	6.4	2.4	0.17	23	23 20.1	23 24 6.37	1 29 5.3	14.3	5.4	0.37
7	0 31.8	21 38 33.11	16 8 34.1	6.4	2.5	0.17	24	23 14.3	23 22 10.22	1 57 41.3	14.2	5.4	0.36
8	0 34.9	21 45 33.59	15 30 3.0	6.5	2.5	0.17	25	23 8.8	23 20 33.72	2 24 35.5	14.1	5.4	0.36
9	0 37.9	21 52 32.92	14 50 5.9	6.5	2.5	0.17	26	23 3.6	23 19 17.80	2 49 31.8	14.0	5.3	0.36
10	0 40.9	21 59 30.83	-14 8 45.2	6.6	2.5	0.17	27	22 58.7	23 18 22.93	-3 12 17.4	13.8	5.3	0.35
11	0 43.9	22 6 27.05	13 26 3.7	6.7	2.5	0.17	28	22 54.2	23 17 49.23	3 32 42.9	13.6	5.2	0.35
12	0 46.8	22 13 21.15	12 42 4.7	6.8	2.6	0.18	29	22 50.1	23 17 36.57	3 50 42.1	13.4	5.1	0.34
13	0 49.7	22 20 12.63	11 56 52.4	6.8	2.6	0.18	30	22 46.3	23 17 44.58	4 6 10.8	13.2	5.0	0.34
14	0 52.6	22 27 0.97	11 10 31.9	6.9	2.6	0.18	31	22 42.8	23 18 12.71	4 19 7.2	13.0	4.9	0.33
15	0 55.4	22 33 45.54	-10 23 8.8	7.0	2.6	0.18	Apr. 1	22 39.7	23 19 0.28	-4 29 31.2	12.8	4.8	0.33
16	0 58.1	22 40 25.58	9 34 50.6	7.1	2.7	0.18	2	22 36.8	23 20 6.52	-4 37 23.9	12.5	4.8	0.32

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	22 39.7	23 19 0.28	4 29 31.2	12.8	4.8	0.33	May 16	23 24.8	3 1 38.55	+16 23 28.4	6.8	2.6	0.18
2	22 36.8	23 20 6.52	4 37 23.9	12.5	4.8	0.32	17	23 29.1	3 9 53.61	17 7 57.6	6.8	2.6	0.18
3	22 34.3	23 21 30.61	4 42 47.7	12.3	4.7	0.32	18	23 33.5	3 18 18.34	17 51 40.6	6.7	2.5	0.18
4	22 32.1	23 23 11.68	4 45 45.4	12.1	4.6	0.31	19	23 38.1	3 26 52.43	18 34 26.0	6.7	2.5	0.18
5	22 30.1	23 25 8.86	4 46 20.8	11.9	4.5	0.30	20	23 42.8	3 35 35.37	19 16 1.4	6.7	2.5	0.18
6	22 28.4	23 27 21.29	4 44 38.0	11.7	4.4	0.29	21	23 47.7	3 44 26.50	+19 56 14.1	6.7	2.5	0.18
7	22 26.9	23 29 48.12	4 40 40.9	11.5	4.3	0.29	22	23 52.7	3 53 25.02	20 34 51.8	6.7	2.5	0.18
8	22 25.6	23 32 28.53	4 34 33.9	11.3	4.3	0.28	23	23 57.8	4 2 30.00	21 11 42.2	6.7	2.5	0.19
9	22 24.5	23 35 21.73	4 26 21.1	11.1	4.2	0.28	25	0 3.1	4 11 40.34	21 46 33.5	6.7	2.5	0.19
10	22 23.6	23 38 27.01	4 16 7.0	10.9	4.1	0.28	26	0 8.5	4 20 54.80	22 19 14.5	6.7	2.5	0.19
11	22 22.9	23 41 43.68	4 3 55.9	10.7	4.0	0.27	27	0 13.9	4 30 11.99	+22 49 35.0	6.8	2.5	0.19
12	22 22.4	23 45 11.12	3 49 51.7	10.5	3.9	0.27	28	0 19.2	4 39 30.45	23 17 26.6	6.8	2.6	0.19
13	22 22.1	23 48 48.76	3 33 58.4	10.3	3.9	0.26	29	0 24.5	4 48 48.80	23 42 42.6	6.9	2.6	0.19
14	22 22.0	23 52 36.06	3 16 20.0	10.1	3.8	0.26	30	0 29.7	4 58 5.61	24 5 17.9	6.9	2.6	0.19
15	22 22.0	23 56 32.53	2 57 0.0	9.9	3.7	0.26	31	0 35.0	5 7 19.46	24 25 9.1	7.0	2.6	0.19
16	22 22.2	0 0 37.74	2 36 1.9	9.7	3.6	0.25	June 1	0 40.1	5 16 29.03	+24 42 14.7	7.0	2.6	0.19
17	22 22.5	0 4 51.32	2 13 29.5	9.6	3.6	0.25	2	0 45.2	5 25 33.05	24 56 34.7	7.1	2.7	0.20
18	22 22.9	0 9 12.96	1 49 25.5	9.4	3.5	0.24	3	0 50.3	5 34 30.34	25 8 10.5	7.2	2.7	0.20
19	22 23.4	0 13 42.36	1 23 53.2	9.3	3.5	0.24	4	0 55.2	5 43 19.86	25 17 5.0	7.2	2.7	0.20
20	22 24.0	0 18 19.23	0 56 55.5	9.1	3.5	0.24	5	1 0.0	5 52 0.59	25 23 22.4	7.3	2.7	0.21
21	22 24.7	0 23 3.36	0 28 35.5	9.0	3.4	0.23	6	1 4.6	6 0 31.70	+25 27 7.7	7.4	2.8	0.21
22	22 25.6	0 27 54.60	0 1 4.1	8.8	3.4	0.23	7	1 9.0	6 8 52.44	25 28 26.5	7.5	2.8	0.21
23	22 26.7	0 32 52.80	0 32 0.3	8.7	3.3	0.22	8	1 13.2	6 17 2.22	25 27 25.3	7.6	2.9	0.21
24	22 28.0	0 37 57.86	1 4 10.6	8.6	3.3	0.22	9	1 17.1	6 25 0.55	25 24 11.0	7.7	2.9	0.22
25	22 29.3	0 43 9.75	1 37 32.5	8.5	3.2	0.22	10	1 20.8	6 32 46.96	25 18 50.6	7.8	3.0	0.22
26	22 30.7	0 48 28.12	+2 12 3.3	8.3	3.1	0.21	11	1 24.4	6 40 21.06	+25 11 31.2	8.0	3.0	0.22
27	22 32.2	0 53 53.91	2 47 40.8	8.2	3.1	0.21	12	1 27.8	6 47 42.60	25 2 20.4	8.1	3.1	0.23
28	22 33.8	0 59 26.21	3 24 22.1	8.1	3.0	0.20	13	1 31.0	6 54 51.26	24 51 25.4	8.3	3.1	0.23
29	22 35.4	1 5 5.41	4 2 5.0	8.0	3.0	0.20	14	1 34.1	7 1 46.87	24 38 53.5	8.4	3.2	0.23
30	22 37.2	1 10 51.62	4 40 46.3	7.9	3.0	0.20	15	1 36.9	7 8 29.21	24 24 51.9	8.5	3.2	0.24
May 1	22 39.1	1 16 44.93	+5 20 23.6	7.8	3.0	0.20	16	1 39.4	7 14 58.10	+24 9 28.2	8.7	3.3	0.24
2	22 41.2	1 22 45.53	6 0 53.9	7.7	2.9	0.19	17	1 41.7	7 21 13.38	23 52 49.1	8.8	3.3	0.24
3	22 43.4	1 28 53.53	6 42 14.0	7.6	2.9	0.19	18	1 43.8	7 27 14.97	23 35 1.5	9.0	3.4	0.25
4	22 45.7	1 35 9.17	7 24 21.0	7.5	2.9	0.19	19	1 45.6	7 33 2.69	23 16 12.4	9.2	3.5	0.25
5	22 48.1	1 41 32.68	8 7 11.5	7.4	2.9	0.19	20	1 47.2	7 38 36.46	22 56 28.0	9.3	3.5	0.25
6	22 50.7	1 48 4.27	+8 50 41.7	7.4	2.8	0.18	21	1 48.6	7 43 56.11	+22 35 55.1	9.5	3.6	0.26
7	22 53.4	1 54 44.20	9 34 47.5	7.3	2.8	0.18	22	1 49.8	7 49 1.49	22 14 40.3	9.7	3.6	0.26
8	22 56.3	2 1 32.71	10 19 24.7	7.2	2.7	0.18	23	1 50.7	7 53 52.44	21 52 49.9	9.9	3.7	0.27
9	22 59.3	2 8 30.10	11 4 28.5	7.2	2.7	0.18	24	1 51.4	7 58 28.81	21 30 30.2	10.1	3.8	0.27
10	23 2.5	2 15 36.61	11 49 53.2	7.1	2.7	0.18	25	1 51.9	8 2 50.39	21 7 47.2	10.3	3.9	0.27
11	23 5.8	2 22 52.46	+12 35 33.1	7.1	2.7	0.18	26	1 52.2	8 6 57.00	+20 44 47.5	10.5	3.9	0.28
12	23 9.3	2 30 17.91	13 21 21.8	7.0	2.6	0.18	27	1 52.1	8 10 48.41	20 21 37.2	10.7	4.0	0.29
13	23 12.9	2 37 53.14	14 7 12.1	7.0	2.6	0.18	28	1 51.7	8 14 24.36	19 58 22.5	10.9	4.1	0.29
14	23 16.7	2 45 38.29	14 52 55.9	6.9	2.6	0.18	29	1 50.9	8 17 44.59	19 35 9.3	11.1	4.2	0.30
15	23 20.7	2 53 33.42	15 38 24.4	6.9	2.6	0.18	30	1 49.9	8 20 48.83	19 12 4.3	11.4	4.3	0.30
16	23 24.8	3 1 38.55	+16 23 28.4	6.8	2.6	0.18	July 1	1 48.7	8 23 36.76	+18 49 13.5	11.6	4.4	0.31
17	23 29.1	3 9 53.61	+17 7 57.6	6.8	2.6	0.18	2	1 47.3	8 26 8.07	+18 26 43.4	11.9	4.5	0.31

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 1	1 48.7	8 23 36.76	+18 49 13.5	11.6	4.4	0.31	Aug. 14	22 49.6	8 21 12.98	+18 56 11.5	9.1	3.4	0.25
2	1 47.3	8 26 8.07	18 26 43.4	11.9	4.5	0.31	15	22 51.1	8 26 36.45	18 52 59.9	8.9	3.3	0.25
3	1 45.7	8 28 22.44	18 4 40.4	12.1	4.6	0.32	16	22 52.9	8 32 22.06	18 47 14.8	8.6	3.2	0.24
4	1 43.8	8 30 19.50	17 43 11.0	12.3	4.7	0.32	17	22 55.0	8 38 28.16	18 38 49.5	8.4	3.2	0.23
5	1 41.6	8 31 58.97	17 22 21.9	12.6	4.8	0.32	18	22 57.5	8 44 52.93	18 27 39.0	8.2	3.1	0.22
6	1 39.1	8 33 20.49	+17 2 19.4	12.8	4.9	0.33	19	23 0.2	8 51 34.41	+18 13 39.9	8.0	3.0	0.21
7	1 36.2	8 34 23.79	16 43 10.7	13.0	5.0	0.34	20	23 3.2	8 58 30.59	17 56 51.0	7.8	3.0	0.21
8	1 32.9	8 35 8.60	16 25 2.3	13.2	5.1	0.34	21	23 6.4	9 5 39.42	17 37 12.9	7.6	2.9	0.20
9	1 29.3	8 35 34.72	16 8 0.8	13.4	5.1	0.35	22	23 9.8	9 12 58.78	17 14 48.1	7.5	2.9	0.20
10	1 25.4	8 35 42.05	15 52 12.6	13.6	5.2	0.35	23	23 13.3	9 20 26.54	16 49 41.2	7.3	2.9	0.20
11	1 21.2	8 35 30.54	+15 37 44.0	13.8	5.3	0.36	24	23 16.9	9 28 0.59	+16 21 58.9	7.2	2.8	0.19
12	1 16.8	8 35 0.28	15 24 41.2	14.0	5.4	0.36	25	23 20.6	9 35 39.00	15 51 49.2	7.1	2.8	0.19
13	1 12.1	8 34 11.52	15 13 9.8	14.2	5.5	0.37	26	23 24.3	9 43 19.99	15 19 21.2	7.0	2.7	0.19
14	1 7.2	8 33 4.70	15 3 15.1	14.4	5.5	0.37	27	23 28.0	9 51 1.95	14 44 44.8	6.9	2.6	0.18
15	1 2.0	8 31 40.41	14 55 1.8	14.5	5.6	0.37	28	23 31.7	9 58 43.46	14 8 10.7	6.8	2.6	0.18
16	0 56.5	8 29 59.51	+14 48 34.0	14.7	5.6	0.38	29	23 35.4	10 6 23.25	+13 29 49.8	6.7	2.6	0.18
17	0 50.7	8 28 3.09	14 43 54.6	14.8	5.6	0.38	30	23 39.1	10 14 0.28	12 49 53.1	6.7	2.5	0.17
18	0 44.5	8 25 52.51	14 41 5.4	15.0	5.7	0.39	31	23 42.7	10 21 33.68	12 8 31.6	6.6	2.5	0.17
19	0 38.0	8 23 29.42	14 40 7.1	15.1	5.7	0.39	Sept. 1	23 46.3	10 29 2.78	11 25 55.7	6.6	2.5	0.17
20	0 31.5	8 20 55.73	14 40 59.3	15.1	5.7	0.39	2	23 49.8	10 36 26.99	10 42 15.6	6.6	2.5	0.17
21	0 24.9	8 18 13.62	+14 43 40.2	15.1	5.7	0.39	3	23 53.2	10 43 45.94	+ 9 57 40.6	6.5	2.5	0.17
22	0 18.2	8 15 25.52	14 48 6.5	15.1	5.7	0.39	4	23 56.5	10 50 59.35	9 12 19.7	6.5	2.4	0.16
23	0 11.4	8 12 34.09	14 54 13.5	15.0	5.7	0.39	5	23 59.6	10 58 7.06	8 26 20.9	6.4	2.4	0.16
24	0 4.6	8 9 42.12	15 1 55.5	15.0	5.7	0.39	7	0 2.6	11 5 8.97	7 39 51.6	6.4	2.4	0.16
24	23 57.9	8 6 52.52	15 11 5.1	14.9	5.7	0.38	8	0 5.6	11 12 5.12	6 52 58.6	6.4	2.4	0.16
25	23 51.2	8 4 8.28	+15 21 34.3	14.7	5.6	0.38	9	0 8.5	11 18 55.53	+ 6 5 47.9	6.4	2.4	0.16
26	23 44.7	8 1 32.40	15 33 13.9	14.5	5.6	0.38	10	0 11.3	11 25 40.35	5 18 25.1	6.3	2.4	0.16
27	23 38.4	7 59 7.78	15 45 54.0	14.4	5.5	0.37	11	0 14.0	11 32 19.71	4 30 55.3	6.3	2.4	0.16
28	23 32.3	7 56 57.16	15 59 24.1	14.2	5.4	0.37	12	0 16.6	11 38 53.77	3 43 23.0	6.3	2.4	0.16
29	23 26.4	7 55 3.11	16 13 33.5	14.0	5.3	0.36	13	0 19.2	11 45 22.70	2 55 42.4	6.3	2.4	0.16
30	23 20.9	7 53 28.00	+16 28 11.1	13.7	5.2	0.36	14	0 21.7	11 51 46.68	+ 2 8 27.5	6.3	2.4	0.16
31	23 15.8	7 52 13.97	16 43 5.6	13.4	5.1	0.35	15	0 24.1	11 58 5.93	1 21 11.6	6.3	2.4	0.16
Aug. 1	23 11.0	7 51 22.86	16 58 5.5	13.1	5.0	0.34	16	0 26.4	12 4 20.65	+ 0 34 7.7	6.3	2.4	0.16
2	23 6.6	7 50 56.23	17 12 59.5	12.8	4.8	0.34	17	0 28.5	12 10 31.09	- 0 12 41.3	6.3	2.4	0.16
3	23 2.7	7 50 55.37	17 27 36.5	12.5	4.7	0.33	18	0 30.6	12 16 37.45	0 59 12.9	6.4	2.4	0.16
4	22 59.2	7 51 21.31	+17 41 44.9	12.2	4.6	0.32	19	0 32.7	12 22 39.98	- 1 45 24.9	6.4	2.4	0.16
5	22 56.2	7 52 14.83	17 55 13.7	11.9	4.5	0.31	20	0 34.7	12 28 38.84	2 31 15.3	6.4	2.4	0.17
6	22 53.7	7 53 36.45	18 7 51.6	11.6	4.4	0.30	21	0 36.7	12 34 34.29	3 16 42.0	6.4	2.5	0.17
7	22 51.5	7 55 26.45	18 19 27.2	11.2	4.2	0.30	22	0 38.7	12 40 26.49	4 1 43.0	6.4	2.5	0.17
8	22 49.8	7 57 44.91	18 29 49.6	10.9	4.1	0.29	23	0 40.6	12 46 15.61	4 46 16.9	6.5	2.5	0.17
9	22 48.6	8 0 31.71	+18 38 47.7	10.6	4.0	0.28	24	0 42.4	12 52 1.82	- 5 30 21.9	6.5	2.5	0.17
10	22 47.9	8 3 46.53	18 46 10.2	10.3	3.9	0.27	25	0 44.2	12 57 45.29	6 13 56.5	6.5	2.5	0.17
11	22 47.7	8 7 28.86	18 51 46.3	10.0	3.8	0.26	26	0 45.9	13 3 26.17	6 56 59.0	6.6	2.5	0.17
12	22 47.9	8 11 38.01	18 55 25.3	9.7	3.6	0.26	27	0 47.6	13 9 4.61	7 39 28.3	6.6	2.5	0.17
13	22 48.6	8 16 13.08	18 56 57.0	9.4	3.5	0.26	28	0 49.2	13 14 40.74	8 21 22.9	6.6	2.5	0.17
14	22 49.6	8 21 12.98	+18 56 11.5	9.1	3.4	0.25	29	0 50.8	13 20 14.66	- 9 2 41.4	6.7	2.5	0.17
15	22 51.1	8 26 36.45	+18 52 59.9	8.9	3.3	0.25	30	0 52.4	13 25 46.45	- 9 43 22.8	6.7	2.6	0.18

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	0 54.0	13 31 16.21	10 23 25.6	6.8	2.6	0.18	Nov. 15	23 25.5	15 3 52.16	16 21 6.1	12.8	4.9	0.34
2	0 55.5	13 36 43.98	11 2 48.3	6.8	2.6	0.18	16	23 17.3	14 59 35.30	15 44 26.4	12.6	4.8	0.33
3	0 57.0	13 42 9.82	11 41 29.6	6.8	2.6	0.18	17	23 9.7	14 55 50.14	15 11 17.4	12.4	4.7	0.32
4	0 58.4	13 47 33.74	12 19 28.1	6.9	2.6	0.18	18	23 2.6	14 52 42.37	14 42 28.4	12.1	4.6	0.31
5	0 59.8	13 52 55.74	12 56 42.5	6.9	2.7	0.18	19	22 56.2	14 50 15.77	14 18 33.6	11.8	4.5	0.30
6	1 1.2	13 58 15.79	13 33 11.3	7.0	2.7	0.18	20	22 50.6	14 48 32.21	13 59 52.0	11.5	4.4	0.30
7	1 2.6	14 3 33.86	14 8 52.9	7.0	2.7	0.18	21	22 45.7	14 47 32.04	13 46 29.9	11.2	4.2	0.29
8	1 3.9	14 8 49.90	14 43 45.6	7.1	2.7	0.18	22	22 41.4	14 47 14.40	13 38 21.2	10.9	4.1	0.28
9	1 5.2	14 14 3.78	15 17 47.8	7.1	2.7	0.18	23	22 37.9	14 47 37.37	13 35 10.9	10.6	4.0	0.28
10	1 6.4	14 19 15.36	15 50 58.1	7.2	2.8	0.19	24	22 35.0	14 48 38.43	13 36 37.5	10.3	3.9	0.27
11	1 7.6	14 24 24.44	16 23 14.3	7.3	2.8	0.19	25	22 32.6	14 50 14.63	13 42 15.5	10.0	3.8	0.26
12	1 8.8	14 29 30.85	16 54 34.5	7.4	2.8	0.19	26	22 30.8	14 52 22.91	13 51 37.8	9.7	3.7	0.25
13	1 9.9	14 34 34.29	17 24 56.7	7.5	2.8	0.19	27	22 29.5	14 55 0.17	14 4 16.1	9.4	3.6	0.25
14	1 11.0	14 39 34.43	17 54 18.7	7.6	2.9	0.20	28	22 28.6	14 58 3.44	14 19 43.6	9.1	3.5	0.24
15	1 12.0	14 44 30.93	18 22 38.0	7.7	2.9	0.20	29	22 28.1	15 1 29.93	14 37 34.5	8.9	3.4	0.23
16	1 12.9	14 49 23.38	18 49 52.4	7.8	3.0	0.21	30	22 27.9	15 5 17.06	14 57 24.9	8.7	3.3	0.23
17	1 13.8	14 54 11.25	19 15 59.0	7.9	3.0	0.21	Dec. 1	22 28.1	15 9 22.52	15 18 52.8	8.5	3.2	0.22
18	1 14.5	14 58 54.00	19 40 55.0	8.0	3.0	0.21	2	22 28.5	15 13 44.23	15 41 38.5	8.3	3.2	0.22
19	1 15.2	15 3 30.95	20 4 37.1	8.1	3.1	0.22	3	22 29.1	15 18 20.36	16 5 24.4	8.1	3.1	0.21
20	1 15.8	15 8 1.36	20 27 2.1	8.2	3.1	0.22	4	22 30.0	15 23 9.29	16 29 54.8	7.9	3.1	0.21
21	1 16.2	15 12 24.37	20 48 6.2	8.3	3.2	0.23	5	22 31.1	15 28 9.61	16 54 55.6	7.8	3.0	0.21
22	1 16.5	15 16 38.99	21 7 45.7	8.5	3.3	0.23	6	22 32.4	15 33 20.06	17 20 14.4	7.6	3.0	0.21
23	1 16.6	15 20 44.16	21 25 55.7	8.6	3.4	0.24	7	22 33.8	15 38 39.58	17 45 40.7	7.5	2.9	0.20
24	1 16.6	15 24 38.61	21 42 31.8	8.8	3.4	0.24	8	22 35.3	15 44 7.25	18 11 4.8	7.4	2.9	0.20
25	1 16.4	15 28 20.96	21 57 28.1	9.0	3.5	0.25	9	22 36.9	15 49 42.27	18 36 18.4	7.3	2.8	0.20
26	1 15.9	15 31 49.65	22 10 39.1	9.2	3.6	0.25	10	22 38.6	15 55 23.97	19 1 14.1	7.2	2.7	0.20
27	1 15.2	15 35 2.93	22 21 58.2	9.4	3.6	0.26	11	22 40.4	16 1 11.73	19 25 45.3	7.1	2.7	0.19
28	1 14.2	15 37 58.75	22 31 17.7	9.6	3.7	0.27	12	22 42.3	16 7 5.06	19 49 46.0	7.0	2.7	0.19
29	1 12.8	15 40 35.05	22 38 29.7	9.8	3.7	0.27	13	22 44.3	16 13 3.51	20 13 11.4	6.9	2.6	0.19
30	1 11.1	15 42 49.58	22 43 25.1	10.0	3.8	0.28	14	22 46.4	16 19 6.68	20 35 56.9	6.8	2.6	0.19
31	1 9.0	15 44 39.85	22 45 53.9	10.2	3.9	0.29	15	22 48.7	16 25 14.25	20 57 58.3	6.8	2.6	0.19
Nov. 1	1 6.5	15 46 3.31	22 45 44.9	10.5	4.0	0.29	16	22 51.0	16 31 25.94	21 19 11.8	6.7	2.6	0.18
2	1 3.5	15 46 57.31	22 42 46.3	10.7	4.1	0.30	17	22 53.3	16 37 41.49	21 39 34.5	6.7	2.6	0.18
3	0 59.9	15 47 19.24	22 36 45.1	11.0	4.2	0.30	18	22 55.7	16 44 0.66	21 59 2.8	6.6	2.5	0.18
4	0 55.7	15 47 6.65	22 27 28.2	11.2	4.3	0.31	19	22 58.1	16 50 23.26	22 17 34.3	6.6	2.5	0.18
5	0 51.0	15 46 17.41	22 14 42.7	11.5	4.4	0.32	20	23 0.5	16 56 49.11	22 35 6.4	6.5	2.5	0.18
6	0 45.6	15 44 50.00	21 58 16.5	11.8	4.5	0.32	21	23 3.0	17 3 18.07	22 51 36.8	6.5	2.5	0.18
7	0 39.6	15 42 43.61	21 38 1.0	12.0	4.6	0.33	22	23 5.5	17 9 49.96	23 7 3.3	6.4	2.5	0.18
8	0 32.9	15 39 58.60	21 13 51.4	12.3	4.7	0.33	23	23 8.1	17 16 24.65	23 21 23.7	6.4	2.4	0.18
9	0 25.6	15 36 36.74	20 45 49.7	12.5	4.8	0.34	24	23 10.8	17 23 2.04	23 34 36.2	6.3	2.4	0.17
10	0 17.8	15 32 41.31	20 14 5.8	12.7	4.9	0.35	25	23 13.6	17 29 42.00	23 46 39.3	6.3	2.4	0.17
11	0 9.5	15 28 17.40	19 39 2.4	12.9	4.9	0.35	26	23 16.4	17 36 24.42	23 57 31.0	6.3	2.4	0.17
12	0 0.8	15 23 31.86	19 1 14.3	12.9	4.9	0.35	27	23 19.2	17 43 9.20	24 7 9.8	6.2	2.4	0.17
12	23 51.9	15 18 33.01	18 21 29.3	12.9	4.9	0.35	28	23 22.0	17 49 56.21	24 15 34.1	6.2	2.3	0.17
13	23 43.0	15 13 30.24	17 40 47.5	12.8	4.9	0.35	29	23 24.9	17 56 45.36	24 22 42.5	6.2	2.3	0.17
14	23 34.1	15 8 33.39	17 0 16.1	12.8	4.9	0.34	30	23 27.8	18 3 36.55	24 28 33.7	6.2	2.3	0.17
15	23 25.5	15 3 52.16	16 21 6.1	12.8	4.9	0.34	31	23 30.7	18 10 29.67	24 33 6.1	6.2	2.3	0.17

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	21 23.3	16 3 37.95	16 20 54.1	22.6	22.0	1.56	Feb. 15	21 1.4	18 43 7.52	20 6 48.0	12.0	11.7	0.83
1	21 21.2	16 5 27.58	16 22 47.9	22.3	21.6	1.54	16	21 2.0	18 47 37.00	20 6 23.2	11.9	11.6	0.82
2	21 19.3	16 7 23.93	16 25 18.0	21.9	21.2	1.51	17	21 2.6	18 52 7.67	20 5 30.0	11.8	11.5	0.81
3	21 17.5	16 9 26.82	16 28 21.9	21.5	20.9	1.48	18	21 3.2	18 56 39.47	20 4 8.1	11.7	11.4	0.81
4	21 15.7	16 11 36.03	16 31 57.1	21.1	20.5	1.44	19	21 3.8	19 1 12.33	20 2 17.2	11.5	11.3	0.80
5	21 14.0	16 13 51.35	16 36 1.5	20.7	20.2	1.41	20	21 4.4	19 5 46.17	19 59 56.9	11.4	11.1	0.79
6	21 12.3	16 16 12.55	16 40 32.9	20.4	19.9	1.39	21	21 5.0	19 10 20.94	19 57 6.9	11.3	11.0	0.78
7	21 10.8	16 18 39.43	16 45 29.1	20.1	19.6	1.37	22	21 5.6	19 14 56.58	19 53 46.7	11.2	10.9	0.77
8	21 9.4	16 21 11.82	16 50 47.7	19.8	19.3	1.35	23	21 6.3	19 19 33.01	19 49 56.2	11.1	10.8	0.77
9	21 8.0	16 23 49.52	16 56 26.5	19.5	19.0	1.33	24	21 7.0	19 24 10.17	19 45 35.1	11.0	10.7	0.76
10	21 6.8	16 26 32.35	17 2 23.5	19.2	18.7	1.31	25	21 7.7	19 28 48.01	19 40 43.3	10.9	10.6	0.75
11	21 5.7	16 29 20.13	17 8 36.4	18.9	18.4	1.29	26	21 8.4	19 33 26.46	19 35 20.5	10.8	10.5	0.74
12	21 4.6	16 32 12.70	17 15 3.2	18.6	18.1	1.27	27	21 9.1	19 38 5.48	19 29 26.6	10.7	10.4	0.73
13	21 3.6	16 35 9.89	17 21 42.1	18.3	17.8	1.25	28	21 9.8	19 42 44.98	19 23 1.5	10.6	10.3	0.73
14	21 2.7	16 38 11.53	17 28 31.0	18.1	17.6	1.24	Mar. 1	21 10.5	19 47 24.91	19 16 5.2	10.5	10.2	0.73
15	21 1.9	16 41 17.49	17 35 28.1	17.8	17.3	1.22	2	21 11.2	19 52 5.21	19 8 37.6	10.4	10.1	0.72
16	21 1.1	16 44 27.61	17 42 31.6	17.5	17.0	1.20	3	21 11.9	19 56 45.85	19 0 38.6	10.3	10.0	0.71
17	21 0.4	16 47 41.77	17 49 39.7	17.2	16.7	1.18	4	21 12.7	20 1 26.76	18 52 8.4	10.2	9.9	0.70
18	20 59.8	16 50 59.83	17 56 50.8	17.0	16.5	1.16	5	21 13.5	20 6 7.89	18 43 7.0	10.1	9.8	0.69
19	20 59.2	16 54 21.69	18 4 3.2	16.8	16.3	1.15	6	21 14.3	20 10 49.18	18 33 34.5	10.0	9.8	0.69
20	20 58.7	16 57 47.22	18 11 15.3	16.5	16.1	1.14	7	21 15.1	20 15 30.56	18 23 30.9	9.9	9.8	0.68
21	20 58.2	17 1 16.32	18 18 25.7	16.3	15.9	1.12	8	21 15.8	20 20 12.00	18 12 56.3	9.8	9.7	0.67
22	20 57.8	17 4 48.92	18 25 32.8	16.1	15.7	1.11	9	21 16.5	20 24 53.42	18 1 51.0	9.7	9.6	0.67
23	20 57.5	17 8 24.88	18 32 35.2	15.9	15.5	1.09	10	21 17.2	20 29 34.79	17 50 15.3	9.7	9.5	0.66
24	20 57.2	17 12 4.08	18 39 31.4	15.7	15.3	1.08	11	21 18.0	20 34 16.06	17 38 9.3	9.6	9.4	0.65
25	20 57.0	17 15 46.44	18 46 20.1	15.5	15.1	1.07	12	21 18.8	20 38 57.19	17 25 33.2	9.5	9.4	0.65
26	20 56.8	17 19 31.87	18 52 59.8	15.3	14.9	1.05	13	21 19.5	20 43 38.12	17 12 27.3	9.4	9.3	0.64
27	20 56.7	17 23 20.28	18 59 29.3	15.1	14.7	1.04	14	21 20.2	20 48 18.83	16 58 52.1	9.3	9.2	0.63
28	20 56.6	17 27 11.57	19 5 47.4	14.9	14.5	1.02	15	21 20.9	20 52 59.28	16 44 47.8	9.3	9.1	0.63
29	20 56.5	17 31 5.66	19 11 52.9	14.7	14.3	1.01	16	21 21.7	20 57 39.43	16 30 14.8	9.2	9.0	0.63
30	20 56.5	17 35 2.47	19 17 44.6	14.5	14.1	0.99	17	21 22.4	21 2 19.24	16 15 13.4	9.2	9.0	0.62
31	20 56.6	17 39 1.88	19 23 21.3	14.3	13.9	0.98	18	21 23.1	21 6 58.70	15 59 44.0	9.1	8.9	0.62
Feb. 1	20 56.7	17 43 3.81	19 28 42.1	14.1	13.7	0.97	19	21 23.8	21 11 37.79	15 43 47.1	9.1	8.8	0.61
2	20 56.8	17 47 8.19	19 33 45.8	13.9	13.5	0.96	20	21 24.5	21 16 16.48	15 27 22.9	9.0	8.7	0.61
3	20 56.9	17 51 14.93	19 38 31.4	13.8	13.4	0.95	21	21 25.2	21 20 54.74	15 10 31.9	8.9	8.6	0.60
4	20 57.1	17 55 23.93	19 42 58.0	13.6	13.3	0.94	22	21 25.9	21 25 32.57	14 53 14.6	8.8	8.6	0.59
5	20 57.4	17 59 35.11	19 47 4.6	13.4	13.1	0.93	23	21 26.6	21 30 9.94	14 35 31.5	8.8	8.5	0.59
6	20 57.7	18 3 48.39	19 50 50.3	13.2	13.0	0.92	24	21 27.2	21 34 46.84	14 17 22.9	8.7	8.4	0.58
7	20 58.0	18 8 3.66	19 54 13.9	13.1	12.8	0.91	25	21 27.8	21 39 23.26	13 58 49.3	8.7	8.4	0.58
8	20 58.3	18 12 20.83	19 57 14.8	13.0	12.7	0.90	26	21 28.5	21 43 59.19	13 39 51.4	8.6	8.3	0.57
9	20 58.7	18 16 39.84	19 59 52.4	12.9	12.6	0.89	27	21 29.2	21 48 34.64	13 20 29.5	8.5	8.3	0.57
10	20 59.1	18 21 0.58	20 2 5.9	12.7	12.4	0.88	28	21 29.8	21 53 9.60	13 0 44.1	8.5	8.2	0.57
11	20 59.5	18 25 22.98	20 3 54.5	12.6	12.3	0.87	29	21 30.4	21 57 44.06	12 40 35.7	8.4	8.2	0.56
12	20 59.9	18 29 46.95	20 5 17.7	12.4	12.1	0.86	30	21 31.0	22 2 18.03	12 20 4.9	8.4	8.1	0.56
13	21 0.4	18 34 12.42	20 6 14.7	12.3	12.0	0.85	31	21 31.6	22 6 51.49	11 59 12.3	8.3	8.1	0.55
14	21 0.9	18 38 39.30	20 6 45.0	12.2	11.9	0.84	Apr. 1	21 32.2	22 11 24.46	11 37 58.3	8.3	8.1	0.55
15	21 1.4	18 43 7.52	20 6 48.0	12.0	11.7	0.83	2	21 32.8	22 15 56.94	11 16 23.6	8.2	8.0	0.54

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	21 32.2	22 11 24.46	-11 37 58.3	8.3	8.1	0.55	May 16	21 54.8	1 31 31.10	+7 38 38.5	6.5	6.3	0.42
2	21 32.8	22 15 56.94	11 16 23.6	8.2	8.0	0.54	17	21 55.4	1 36 1.15	8 4 57.2	6.5	6.3	0.42
3	21 33.4	22 20 28.92	10 54 28.6	8.2	8.0	0.53	18	21 56.0	1 40 31.81	8 31 7.1	6.4	6.2	0.42
4	21 34.0	22 25 0.42	10 32 13.8	8.1	7.9	0.53	19	21 56.6	1 45 3.11	8 57 7.5	6.4	6.2	0.42
5	21 34.6	22 29 31.42	10 9 40.2	8.0	7.8	0.53	20	21 57.2	1 49 35.10	9 22 57.7	6.4	6.2	0.42
6	21 35.2	22 34 1.94	9 46 48.2	7.9	7.7	0.53	21	21 57.8	1 54 7.79	+9 48 36.9	6.4	6.1	0.42
7	21 35.8	22 38 31.98	9 23 38.5	7.9	7.7	0.52	22	21 58.4	1 58 41.24	10 14 4.5	6.3	6.1	0.42
8	21 36.3	22 43 1.55	9 0 11.4	7.8	7.6	0.52	23	21 59.0	2 3 15.47	10 39 19.8	6.3	6.0	0.42
9	21 36.8	22 47 30.67	8 36 27.8	7.8	7.6	0.51	24	21 59.6	2 7 50.51	11 4 22.2	6.3	6.0	0.42
10	21 37.4	22 51 59.34	8 12 28.3	7.8	7.6	0.51	25	22 0.3	2 12 26.39	11 29 11.0	6.3	6.0	0.41
11	21 37.9	22 56 27.57	7 48 13.5	7.7	7.5	0.50	26	22 1.0	2 17 3.12	+11 53 45.5	6.2	6.0	0.41
12	21 38.4	23 0 55.38	7 23 44.0	7.7	7.5	0.50	27	22 1.7	2 21 40.75	12 18 5.1	6.2	6.0	0.41
13	21 38.9	23 5 22.78	6 59 0.5	7.6	7.4	0.50	28	22 2.4	2 26 19.31	12 42 9.1	6.1	6.0	0.41
14	21 39.4	23 9 49.78	6 34 3.6	7.6	7.4	0.49	29	22 3.1	2 30 58.82	13 5 56.8	6.1	6.0	0.41
15	21 39.9	23 14 16.42	6 8 54.1	7.6	7.4	0.49	30	22 3.8	2 35 39.29	13 29 27.4	6.1	6.0	0.41
16	21 40.4	23 18 42.71	5 43 32.4	7.5	7.3	0.49	31	22 4.5	2 40 20.76	+13 52 40.1	6.1	6.0	0.41
17	21 40.9	23 23 8.67	5 17 59.2	7.5	7.3	0.48	June 1	22 5.3	2 45 3.24	14 15 34.4	6.0	5.9	0.41
18	21 41.4	23 27 34.34	4 52 15.0	7.4	7.2	0.48	2	22 6.1	2 49 46.74	14 38 9.5	6.0	5.9	0.41
19	21 41.8	23 31 59.73	4 26 20.5	7.4	7.2	0.48	3	22 6.9	2 54 31.30	15 0 24.7	6.0	5.9	0.41
20	21 42.3	23 36 24.87	4 0 16.6	7.4	7.1	0.48	4	22 7.7	2 59 16.92	15 22 19.2	6.0	5.9	0.40
21	21 42.8	23 40 49.78	3 34 3.7	7.3	7.1	0.47	5	22 8.5	3 4 3.60	+15 43 52.3	6.0	5.9	0.40
22	21 43.3	23 45 14.50	3 7 42.5	7.3	7.0	0.47	6	22 9.3	3 8 51.36	16 5 3.4	5.9	5.8	0.40
23	21 43.8	23 49 39.06	2 41 13.6	7.2	7.0	0.46	7	22 10.2	3 13 40.21	16 25 52.0	5.9	5.8	0.40
24	21 44.2	23 54 3.47	2 14 37.8	7.2	7.0	0.46	8	22 11.1	3 18 30.15	16 46 17.3	5.9	5.8	0.40
25	21 44.6	23 58 27.77	1 47 55.6	7.2	7.0	0.46	9	22 12.0	3 23 21.21	17 6 18.5	5.9	5.8	0.40
26	21 45.0	0 2 52.02	1 21 7.5	7.1	6.9	0.46	10	22 12.9	3 28 13.38	+17 25 54.7	5.9	5.8	0.40
27	21 45.5	0 7 16.23	0 54 14.0	7.1	6.9	0.45	11	22 13.8	3 33 6.67	17 45 5.3	5.8	5.7	0.40
28	21 46.0	0 11 40.42	0 27 16.0	7.0	6.8	0.45	12	22 14.8	3 38 1.06	18 3 49.7	5.8	5.7	0.40
29	21 46.5	0 16 4.64	0 0 14.0	7.0	6.8	0.45	13	22 15.8	3 42 56.58	18 22 7.2	5.8	5.7	0.40
30	21 46.9	0 20 28.93	+0 26 51.0	7.0	6.8	0.45	14	22 16.8	3 47 53.20	18 39 57.1	5.8	5.7	0.39
May 1	21 47.4	0 24 53.30	+0 53 58.7	6.9	6.7	0.45	15	22 17.8	3 52 50.93	+18 57 18.8	5.8	5.7	0.39
2	21 47.8	0 29 17.80	1 21 8.6	6.9	6.7	0.44	16	22 18.8	3 57 49.76	19 14 11.6	5.8	5.6	0.39
3	21 48.3	0 33 42.46	1 48 19.9	6.8	6.6	0.44	17	22 19.9	4 2 49.68	19 30 34.7	5.7	5.6	0.39
4	21 48.8	0 38 7.31	2 15 31.7	6.8	6.6	0.44	18	22 21.0	4 7 50.68	19 46 27.6	5.7	5.6	0.39
5	21 49.2	0 42 32.38	2 42 43.4	6.8	6.6	0.44	19	22 22.1	4 12 52.75	20 1 49.6	5.7	5.6	0.39
6	21 49.7	0 46 57.71	+3 9 54.4	6.8	6.6	0.44	20	22 23.2	4 17 55.89	+20 16 40.3	5.7	5.6	0.39
7	21 50.2	0 51 23.30	3 37 4.1	6.7	6.5	0.43	21	22 24.3	4 23 0.07	20 30 58.9	5.7	5.5	0.39
8	21 50.7	0 55 49.18	4 4 11.8	6.7	6.5	0.43	22	22 25.5	4 28 5.28	20 44 44.9	5.7	5.5	0.39
9	21 51.2	1 0 15.40	4 31 16.9	6.7	6.5	0.43	23	22 26.7	4 33 11.50	20 57 57.7	5.7	5.5	0.39
10	21 51.7	1 4 42.00	4 58 18.6	6.7	6.5	0.43	24	22 27.9	4 38 18.69	21 10 36.7	5.7	5.5	0.39
11	21 52.2	1 9 9.00	+5 25 16.2	6.6	6.4	0.43	25	22 29.1	4 43 26.85	+21 22 41.4	5.7	5.5	0.39
12	21 52.7	1 13 36.43	5 52 8.8	6.6	6.4	0.43	26	22 30.3	4 48 35.97	21 34 11.4	5.6	5.4	0.39
13	21 53.2	1 18 4.32	6 18 56.0	6.6	6.3	0.43	27	22 31.5	4 53 46.00	21 45 6.1	5.6	5.4	0.39
14	21 53.8	1 22 32.70	6 45 37.2	6.5	6.3	0.43	28	22 32.7	4 58 56.91	21 55 24.9	5.6	5.4	0.39
15	21 54.3	1 27 1.62	7 12 11.6	6.5	6.3	0.42	29	22 33.9	5 4 8.68	22 5 7.3	5.6	5.4	0.39
16	21 54.8	1 31 31.10	+7 38 38.5	6.5	6.3	0.42	30	22 35.2	5 9 21.27	+22 14 13.0	5.6	5.4	0.39
17	21 55.4	1 36 1.15	8 4 57.2	6.5	6.3	0.42	July 1	22 36.5	5 14 34.64	+22 22 41.5	5.6	5.4	0.39

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 1	22 36.5	5 14 34.64	+22 22 41.5	5.6	5.4	0.39	Aug. 15	23 34.1	9 9 47.32	+17 27 5.5	5.2	5.0	0.35
2	22 37.8	5 19 48.74	22 30 32.4	5.5	5.4	0.39	16	23 35.1	9 14 45.74	17 6 38.4	5.2	5.0	0.35
3	22 39.1	5 25 3.54	22 37 45.3	5.5	5.4	0.39	17	23 36.1	9 19 43.11	16 45 42.5	5.2	5.0	0.35
4	22 40.4	5 30 18.98	22 44 19.8	5.5	5.4	0.39	18	23 37.1	9 24 39.44	16 24 18.3	5.1	5.0	0.35
5	22 41.7	5 35 35.02	22 50 15.5	5.5	5.4	0.39	19	23 38.1	9 29 34.72	16 2 26.7	5.1	5.0	0.35
6	22 43.0	5 40 51.62	+22 55 32.0	5.5	5.3	0.39	20	23 39.1	9 34 28.97	+15 40 8.2	5.1	5.0	0.35
7	22 44.3	5 46 8.72	23 0 9.0	5.5	5.3	0.38	21	23 40.0	9 39 22.19	15 17 23.5	5.1	5.0	0.35
8	22 45.7	5 51 26.27	23 4 6.3	5.5	5.3	0.38	22	23 40.9	9 44 14.40	14 54 13.3	5.1	5.0	0.35
9	22 47.0	5 56 44.22	23 7 23.7	5.5	5.3	0.38	23	23 41.8	9 49 5.59	14 30 38.4	5.1	5.0	0.34
10	22 48.3	6 2 2.51	23 10 1.0	5.5	5.3	0.38	24	23 42.7	9 53 55.79	14 6 39.4	5.1	5.0	0.34
11	22 49.7	6 7 21.09	+23 11 58.0	5.4	5.2	0.38	25	23 43.6	9 58 45.02	+13 42 16.9	5.1	5.0	0.34
12	22 51.1	6 12 39.91	23 13 14.5	5.4	5.2	0.38	26	23 44.5	10 3 33.30	13 17 31.6	5.1	5.0	0.34
13	22 52.3	6 17 58.92	23 13 50.3	5.4	5.2	0.38	27	23 45.3	10 8 20.65	12 52 24.2	5.1	5.0	0.34
14	22 53.9	6 23 18.06	23 13 45.4	5.4	5.2	0.38	28	23 46.1	10 13 7.09	12 26 55.6	5.1	5.0	0.34
15	22 55.3	6 28 37.26	23 12 59.6	5.4	5.2	0.38	29	23 46.9	10 17 52.63	12 1 6.3	5.1	5.0	0.34
16	22 56.7	6 33 56.48	+23 11 33.0	5.4	5.2	0.38	30	23 47.7	10 22 37.30	+11 34 57.2	5.1	5.0	0.34
17	22 58.1	6 39 15.64	23 9 25.5	5.4	5.2	0.38	31	23 48.5	10 27 21.12	11 8 29.0	5.1	5.0	0.34
18	22 59.4	6 44 34.70	23 6 37.1	5.4	5.2	0.38	Sept. 1	23 49.3	10 32 4.13	10 41 42.3	5.1	5.0	0.34
19	23 0.8	6 49 53.61	23 3 8.0	5.3	5.2	0.38	2	23 50.1	10 36 46.34	10 14 37.8	5.1	5.0	0.33
20	23 2.2	6 55 12.32	22 58 58.1	5.3	5.2	0.38	3	23 50.9	10 41 27.78	9 47 16.3	5.1	5.0	0.33
21	23 3.6	7 0 30.78	+22 54 7.7	5.3	5.2	0.38	4	23 51.6	10 46 8.49	+ 9 19 38.7	5.1	5.0	0.33
22	23 4.9	7 5 48.95	22 48 36.7	5.3	5.2	0.38	5	23 52.3	10 50 48.47	8 51 45.6	5.1	5.0	0.33
23	23 6.2	7 11 6.78	22 42 25.5	5.3	5.2	0.38	6	23 53.0	10 55 27.77	8 23 37.7	5.1	5.0	0.33
24	23 7.6	7 16 24.20	22 35 34.2	5.3	5.1	0.38	7	23 53.7	11 0 6.43	7 55 15.7	5.1	5.0	0.33
25	23 8.9	7 21 41.18	22 28 2.9	5.3	5.1	0.38	8	23 54.4	11 4 44.46	7 26 40.3	5.1	5.0	0.33
26	23 10.2	7 26 57.67	+22 19 51.9	5.3	5.1	0.38	9	23 55.1	11 9 21.91	+ 6 57 52.4	5.1	5.0	0.33
27	23 11.5	7 32 13.61	22 11 1.5	5.3	5.1	0.37	10	23 55.8	11 13 58.80	6 28 52.8	5.1	5.0	0.33
28	23 12.8	7 37 28.97	22 1 31.9	5.3	5.1	0.37	11	23 56.4	11 18 35.16	5 59 42.0	5.1	5.0	0.33
29	23 14.1	7 42 43.72	21 51 23.5	5.3	5.1	0.37	12	23 57.1	11 23 11.03	5 30 20.9	5.1	5.0	0.33
30	23 15.4	7 47 57.82	21 40 36.7	5.2	5.1	0.37	13	23 57.8	11 27 46.46	5 0 50.1	5.1	5.0	0.33
31	23 16.7	7 53 11.23	+21 29 11.8	5.2	5.1	0.37	14	23 58.4	11 32 21.49	+ 4 31 10.5	5.1	5.0	0.33
Aug. 1	23 18.0	7 58 23.92	21 17 9.3	5.2	5.1	0.37	15	23 59.0	11 36 56.15	4 1 22.8	5.1	5.0	0.33
2	23 19.2	8 3 35.83	21 4 29.5	5.2	5.1	0.37	16	23 59.6	11 41 30.47	3 31 27.6	5.1	5.0	0.33
3	23 20.4	8 8 46.93	20 51 12.8	5.2	5.1	0.37	18	0 0.2	11 46 4.51	3 1 25.8	5.1	5.0	0.33
4	23 21.6	8 13 57.19	20 37 19.7	5.2	5.1	0.36	19	0 0.8	11 50 38.29	2 31 18.1	5.1	5.0	0.33
5	23 22.8	8 19 6.57	+20 22 50.8	5.2	5.1	0.36	20	0 1.4	11 55 11.87	+ 2 1 5.2	5.1	5.0	0.33
6	23 24.0	8 24 15.04	20 7 46.4	5.2	5.1	0.36	21	0 2.0	11 59 45.28	1 30 47.8	5.1	5.0	0.33
7	23 25.2	8 29 22.58	19 52 7.1	5.2	5.1	0.36	22	0 2.7	12 4 18.57	1 0 26.6	5.1	5.0	0.33
8	23 26.4	8 34 29.17	19 35 53.5	5.2	5.0	0.36	23	0 3.3	12 8 51.79	+ 0 30 2.2	5.1	5.0	0.33
9	23 27.6	8 39 34.80	19 19 6.2	5.2	5.0	0.36	24	0 3.9	12 13 24.97	- 0 0 24.5	5.1	5.0	0.33
10	23 28.7	8 44 39.45	+19 1 45.6	5.2	5.0	0.36	25	0 4.5	12 17 58.18	- 0 30 52.7	5.1	5.0	0.33
11	23 29.8	8 49 43.10	18 43 52.5	5.2	5.0	0.36	26	0 5.1	12 22 31.44	1 1 21.8	5.1	5.0	0.33
12	23 30.9	8 54 45.72	18 25 27.2	5.2	5.0	0.36	27	0 5.7	12 27 4.80	1 31 51.0	5.1	5.0	0.33
13	23 32.0	8 59 47.30	18 6 30.6	5.2	5.0	0.35	28	0 6.3	12 31 38.31	2 2 19.6	5.1	5.0	0.33
14	23 33.1	9 4 47.84	17 47 3.1	5.2	5.0	0.35	29	0 6.9	12 36 12.00	2 32 46.9	5.1	5.0	0.33
15	23 34.1	9 9 47.32	+17 27 5.5	5.2	5.0	0.35	30	0 7.5	12 40 45.91	3 3 12.1	5.1	5.0	0.33
16	23 35.1	9 14 45.74	+17 6 38.4	5.2	5.0	0.35	Oct. 1	0 8.1	12 45 20.10	3 33 34.6	5.0	5.0	0.34



## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	0 8.1	12 45 20.10	3 33 34.6	5.0	5.0	0.34	Nov. 16	0 51.6	16 30 14.87	22 15 43.7	5.4	5.3	0.38
2	0 8.8	12 49 54.59	4 3 53.5	5.1	5.0	0.34	17	0 53.0	16 35 34.33	22 29 15.0	5.4	5.3	0.38
3	0 9.4	12 54 29.43	4 34 8.2	5.1	5.0	0.34	18	0 54.4	16 40 54.78	22 42 6.9	5.4	5.3	0.38
4	0 10.0	12 59 4.67	5 4 17.7	5.1	5.0	0.34	19	0 55.8	16 46 16.20	22 54 18.9	5.4	5.3	0.38
5	0 10.7	13 3 40.35	5 34 21.4	5.1	5.0	0.34	20	0 57.2	16 51 38.54	23 5 50.3	5.5	5.3	0.38
6	0 11.4	13 8 16.52	6 4 18.5	5.1	5.0	0.34	21	0 58.7	16 57 1.77	23 16 40.6	5.5	5.3	0.38
7	0 12.1	13 12 53.21	6 34 8.1	5.1	5.0	0.34	22	1 0.1	17 2 23.83	23 26 49.4	5.5	5.3	0.39
8	0 12.8	13 17 30.45	7 3 49.5	5.2	5.0	0.34	23	1 1.6	17 7 50.68	23 36 16.2	5.5	5.3	0.39
9	0 13.5	13 22 8.27	7 33 22.1	5.2	5.0	0.34	24	1 3.1	17 13 16.28	23 45 0.5	5.5	5.3	0.39
10	0 14.2	13 26 46.72	8 2 45.0	5.2	5.0	0.34	25	1 4.6	17 18 42.57	23 53 1.9	5.5	5.4	0.39
11	0 14.9	13 31 25.82	8 31 57.4	5.2	5.0	0.34	26	1 6.1	17 24 9.50	24 0 19.9	5.5	5.4	0.39
12	0 15.6	13 36 5.62	9 0 58.6	5.2	5.0	0.34	27	1 7.6	17 29 37.01	24 6 54.3	5.5	5.4	0.39
13	0 16.3	13 40 46.16	9 29 47.6	5.2	5.0	0.34	28	1 9.1	17 35 5.03	24 12 44.7	5.5	5.4	0.39
14	0 17.0	13 45 27.49	9 58 23.6	5.2	5.0	0.34	29	1 10.6	17 40 33.51	24 17 51.0	5.5	5.4	0.39
15	0 17.7	13 50 9.62	10 26 46.0	5.2	5.0	0.34	30	1 12.1	17 46 2.38	24 22 12.8	5.6	5.4	0.39
16	0 18.5	13 54 52.60	10 54 54.0	5.2	5.0	0.34	Dec. 1	1 13.7	17 51 31.58	24 25 49.9	5.6	5.4	0.39
17	0 19.3	13 59 36.47	11 22 46.8	5.2	5.0	0.34	2	1 15.3	17 57 1.05	24 28 42.0	5.6	5.4	0.40
18	0 20.1	14 4 21.25	11 50 23.5	5.2	5.1	0.34	3	1 16.9	18 2 30.72	24 30 49.0	5.6	5.4	0.40
19	0 20.9	14 9 6.98	12 17 43.4	5.2	5.1	0.34	4	1 18.5	18 8 0.52	24 32 10.8	5.6	5.4	0.40
20	0 21.7	14 13 53.68	12 44 45.8	5.2	5.1	0.34	5	1 20.0	18 13 30.37	24 32 47.1	5.6	5.5	0.40
21	0 22.6	14 18 41.38	13 11 29.7	5.2	5.1	0.34	6	1 21.5	18 19 0.21	24 32 38.0	5.6	5.5	0.40
22	0 23.5	14 23 30.12	13 37 54.3	5.2	5.1	0.34	7	1 23.1	18 24 29.96	24 31 43.5	5.7	5.5	0.40
23	0 24.4	14 28 19.94	14 3 59.1	5.2	5.1	0.35	8	1 24.7	18 29 59.56	24 30 3.8	5.7	5.5	0.40
24	0 25.3	14 33 10.85	14 29 43.1	5.2	5.1	0.35	9	1 26.2	18 35 28.93	24 27 38.7	5.7	5.5	0.40
25	0 26.2	14 38 2.90	14 55 5.5	5.2	5.1	0.35	10	1 27.7	18 40 58.00	24 24 28.5	5.7	5.5	0.40
26	0 27.1	14 42 56.11	15 20 5.6	5.2	5.1	0.35	11	1 29.2	18 46 26.72	24 20 33.2	5.7	5.5	0.40
27	0 28.1	14 47 50.49	15 44 42.5	5.3	5.1	0.35	12	1 30.7	18 51 54.99	24 15 53.0	5.7	5.6	0.41
28	0 29.1	14 52 46.05	16 8 55.4	5.3	5.1	0.35	13	1 32.2	18 57 22.76	24 10 27.9	5.7	5.6	0.41
29	0 30.1	14 57 42.81	16 32 43.6	5.3	5.1	0.35	14	1 33.7	19 2 49.96	24 4 18.3	5.8	5.6	0.41
30	0 31.1	15 2 40.79	16 56 6.2	5.3	5.1	0.36	15	1 35.2	19 8 16.53	23 57 24.4	5.8	5.6	0.41
31	0 32.1	15 7 40.00	17 19 2.5	5.3	5.1	0.36	16	1 36.7	19 13 42.40	23 49 46.5	5.8	5.6	0.41
Nov. 1	0 33.2	15 12 40.44	17 41 31.7	5.3	5.1	0.36	17	1 38.2	19 19 7.53	23 41 25.2	5.8	5.6	0.41
2	0 34.3	15 17 42.14	18 3 32.9	5.3	5.2	0.36	18	1 39.7	19 24 31.86	23 32 20.7	5.8	5.6	0.41
3	0 35.4	15 22 43.10	18 25 5.4	5.3	5.2	0.36	19	1 41.1	19 29 55.34	23 22 33.5	5.8	5.7	0.41
4	0 36.5	15 27 49.32	18 46 8.3	5.3	5.2	0.37	20	1 42.5	19 35 17.91	23 12 3.8	5.8	5.7	0.41
5	0 37.7	15 32 54.81	19 6 40.8	5.3	5.2	0.37	21	1 43.9	19 40 39.51	23 0 52.2	5.9	5.7	0.41
6	0 38.9	15 38 1.55	19 26 42.3	5.3	5.2	0.37	22	1 45.3	19 46 0.12	22 48 59.3	5.9	5.7	0.42
7	0 40.1	15 43 9.53	19 46 12.0	5.3	5.2	0.37	23	1 46.7	19 51 19.69	22 36 25.2	5.9	5.7	0.42
8	0 41.3	15 48 18.74	20 5 9.1	5.3	5.2	0.37	24	1 48.1	19 56 38.17	22 23 10.8	5.9	5.7	0.42
9	0 42.5	15 53 29.18	20 23 32.9	5.4	5.2	0.37	25	1 49.4	20 1 55.53	22 9 16.4	5.9	5.8	0.42
10	0 43.7	15 58 40.83	20 41 22.5	5.4	5.2	0.37	26	1 50.7	20 7 11.72	21 54 42.8	6.0	5.8	0.42
11	0 45.0	16 3 53.67	20 58 37.2	5.4	5.2	0.37	27	1 52.0	20 12 26.72	21 39 30.5	6.0	5.8	0.42
12	0 46.3	16 9 7.67	21 15 16.3	5.4	5.2	0.38	28	1 53.3	20 17 40.50	21 23 40.0	6.0	5.8	0.42
13	0 47.6	16 14 22.82	21 31 19.2	5.4	5.2	0.38	29	1 54.6	20 22 53.04	21 7 12.1	6.0	5.8	0.42
14	0 48.9	16 19 39.09	21 46 45.2	5.4	5.2	0.38	30	1 55.8	20 28 4.30	20 50 7.5	6.0	5.9	0.42
15	0 50.2	16 24 56.45	22 1 33.6	5.4	5.2	0.38	31	1 57.0	20 33 14.26	20 32 26.8	6.0	5.9	0.42
16	0 51.6	16 30 14.87	22 15 43.7	5.4	5.3	0.38	32	1 58.2	20 38 22.91	20 14 10.6	6.1	5.9	0.42

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Mar. 1	18 15.6	16 51 57.52	-22 0 16.9	6.7	3.9	0.28	Apr. 16	16 53.3	18 30 50.91	-23 48 53.5	10.1	5.8	0.42
2	18 14.0	16 54 18.50	22 4 57.7	6.7	3.9	0.28	17	16 51.2	18 32 39.92	23 49 35.8	10.2	5.9	0.43
3	18 12.4	16 56 39.21	22 9 31.1	6.8	3.9	0.28	18	16 49.1	18 34 27.67	23 50 16.8	10.3	5.9	0.43
4	18 10.8	16 58 59.64	22 13 57.1	6.8	3.9	0.28	19	16 46.9	18 36 14.15	23 50 56.7	10.4	6.0	0.44
5	18 9.2	17 1 19.77	22 18 15.8	6.9	4.0	0.29	20	16 44.7	18 37 59.33	23 51 35.5	10.5	6.0	0.44
6	18 7.6	17 3 39.57	-22 22 27.3	6.9	4.0	0.29	21	16 42.5	18 39 43.17	-23 52 13.6	10.6	6.1	0.44
7	18 5.9	17 5 59.03	22 26 31.7	7.0	4.0	0.29	22	16 40.3	18 41 25.67	23 52 51.2	10.7	6.2	0.45
8	18 4.3	17 8 18.14	22 30 28.9	7.1	4.1	0.29	23	16 38.0	18 43 6.77	23 53 28.6	10.8	6.3	0.45
9	18 2.7	17 10 36.86	22 34 19.1	7.1	4.1	0.29	24	16 35.7	18 44 46.44	23 54 6.0	10.9	6.4	0.46
10	18 1.1	17 12 55.18	22 38 2.2	7.2	4.2	0.30	25	16 33.4	18 46 24.67	23 54 43.6	11.1	6.4	0.46
11	17 59.4	17 15 13.08	-22 41 38.3	7.3	4.2	0.30	26	16 31.1	18 48 1.42	-23 55 21.9	11.2	6.5	0.47
12	17 57.8	17 17 30.54	22 45 7.3	7.3	4.2	0.30	27	16 28.8	18 49 36.65	23 56 0.9	11.3	6.5	0.47
13	17 56.1	17 19 47.55	22 48 29.5	7.4	4.2	0.30	28	16 26.4	18 51 10.34	23 56 40.9	11.4	6.6	0.48
14	17 54.5	17 22 4.09	22 51 44.9	7.5	4.3	0.30	29	16 24.0	18 52 42.43	23 57 22.3	11.5	6.6	0.48
15	17 52.8	17 24 20.14	22 54 53.7	7.5	4.3	0.31	30	16 21.6	18 54 12.89	23 58 5.3	11.7	6.7	0.49
16	17 51.1	17 26 35.68	-22 57 56.1	7.6	4.3	0.31	May 1	16 19.1	18 55 41.65	-23 58 50.1	11.8	6.8	0.50
17	17 49.4	17 28 50.70	23 0 51.9	7.7	4.3	0.31	2	16 16.6	18 57 8.68	23 59 37.0	11.9	6.8	0.50
18	17 47.7	17 31 5.19	23 3 41.3	7.7	4.4	0.32	3	16 14.1	18 58 33.92	24 0 26.4	12.0	6.9	0.51
19	17 46.0	17 33 19.15	23 6 24.5	7.8	4.4	0.32	4	16 11.6	18 59 57.32	24 1 18.4	12.1	7.0	0.51
20	17 44.3	17 35 32.55	23 9 1.5	7.8	4.5	0.33	5	16 9.0	19 1 18.85	24 2 13.3	12.3	7.1	0.52
21	17 42.6	17 37 45.37	-23 11 32.4	7.9	4.5	0.33	6	16 6.4	19 2 38.44	-24 3 11.6	12.4	7.2	0.53
22	17 40.9	17 39 57.59	23 13 57.2	8.0	4.6	0.33	7	16 3.8	19 3 56.07	24 4 13.4	12.6	7.3	0.53
23	17 39.1	17 42 9.21	23 16 16.2	8.0	4.6	0.33	8	16 1.1	19 5 11.68	24 5 18.9	12.7	7.4	0.54
24	17 37.3	17 44 20.20	23 18 29.6	8.1	4.7	0.34	9	15 58.4	19 6 25.22	24 6 28.4	12.8	7.4	0.54
25	17 35.6	17 46 30.56	23 20 37.4	8.2	4.7	0.34	10	15 55.6	19 7 36.64	24 7 42.2	13.0	7.5	0.55
26	17 33.8	17 48 40.27	-23 22 39.7	8.3	4.8	0.34	11	15 52.8	19 8 45.89	-24 9 0.7	13.1	7.6	0.56
27	17 32.0	17 50 49.30	23 24 36.6	8.4	4.8	0.34	12	15 50.0	19 9 52.94	24 10 24.0	13.3	7.7	0.56
28	17 30.2	17 52 57.63	23 26 28.3	8.4	4.9	0.35	13	15 47.2	19 10 57.74	24 11 52.4	13.4	7.8	0.57
29	17 28.4	17 55 5.25	23 28 15.1	8.5	4.9	0.35	14	15 44.3	19 12 0.23	24 13 26.3	13.5	7.8	0.57
30	17 26.6	17 57 12.14	23 29 57.0	8.6	5.0	0.36	15	15 41.4	19 13 0.40	24 15 5.7	13.7	7.9	0.58
31	17 24.8	17 59 18.29	-23 31 34.2	8.7	5.0	0.36	16	15 38.4	19 13 58.20	-24 16 51.1	13.8	8.0	0.59
Apr. 1	17 23.0	18 1 23.65	23 33 6.6	8.7	5.0	0.36	17	15 35.4	19 14 53.59	24 18 42.6	14.0	8.1	0.59
2	17 21.1	18 3 28.20	23 34 34.6	8.8	5.1	0.37	18	15 32.3	19 15 46.52	24 20 40.4	14.1	8.1	0.60
3	17 19.2	18 5 31.91	23 35 58.3	8.9	5.1	0.37	19	15 29.2	19 16 36.95	24 22 44.8	14.3	8.2	0.60
4	17 17.3	18 7 34.75	23 37 17.8	9.0	5.2	0.38	20	15 26.1	19 17 24.83	24 24 56.0	14.5	8.3	0.61
5	17 15.4	18 9 36.71	-23 38 33.4	9.1	5.2	0.38	21	15 22.9	19 18 10.14	-24 27 14.2	14.6	8.4	0.61
6	17 13.5	18 11 37.74	23 39 45.2	9.1	5.3	0.38	22	15 19.7	19 18 52.81	24 29 39.7	14.8	8.5	0.62
7	17 11.6	18 13 37.81	23 40 53.3	9.2	5.3	0.39	23	15 16.4	19 19 32.82	24 32 12.6	14.9	8.6	0.62
8	17 9.6	18 15 36.91	23 41 58.0	9.3	5.4	0.39	24	15 13.1	19 20 10.12	24 34 53.0	15.1	8.7	0.63
9	17 7.6	18 17 34.99	23 42 59.4	9.4	5.4	0.40	25	15 9.7	19 20 44.66	24 37 41.2	15.3	8.8	0.64
10	17 5.6	18 19 32.04	-23 43 57.6	9.5	5.5	0.40	26	15 6.3	19 21 16.39	-24 40 37.4	15.4	8.9	0.65
11	17 3.6	18 21 28.01	23 44 53.0	9.6	5.5	0.40	27	15 2.8	19 21 45.26	24 43 41.6	15.6	9.0	0.66
12	17 1.6	18 23 22.88	23 45 45.7	9.7	5.6	0.41	28	14 59.3	19 22 11.24	24 46 53.8	15.8	9.1	0.67
13	16 59.6	18 25 16.64	23 46 35.9	9.8	5.6	0.41	29	14 55.8	19 22 34.26	24 50 14.3	16.0	9.2	0.67
14	16 57.5	18 27 9.24	23 47 23.8	9.9	5.7	0.42	30	14 52.2	19 22 54.26	24 53 43.1	16.2	9.3	0.68
15	16 55.4	18 29 0.68	-23 48 9.6	10.0	5.7	0.42	31	14 48.5	19 23 11.19	-24 57 20.4	16.3	9.4	0.69
16	16 53.3	18 30 50.91	23 48 53.5	10.1	5.8	0.42	June 1	14 44.8	19 23 24.99	-25 1 6.0	16.5	9.5	0.69

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
June 1	14 44.8	19 23 24.99	-25 1 6.0	16.5	9.5	0.69	July 17	11 6.7	18 45 52.90	-28 40 37.5	21.4	12.3	0.94
2	14 41.1	19 23 35.62	25 4 59.9	16.6	9.6	0.70	18	11 1.6	18 44 44.13	28 42 52.3	21.4	12.3	0.94
3	14 37.3	19 23 43.04	25 9 2.1	16.8	9.7	0.71	19	10 56.5	18 43 37.43	28 44 54.0	21.4	12.3	0.94
4	14 33.4	19 23 47.23	25 13 12.4	17.0	9.8	0.72	20	10 51.5	18 42 32.96	28 46 42.8	21.3	12.3	0.94
5	14 29.5	19 23 48.16	25 17 30.8	17.1	9.9	0.73	21	10 46.6	18 41 30.89	28 48 19.0	21.3	12.2	0.93
6	14 25.5	19 23 45.81	-25 21 57.3	17.3	10.0	0.73	22	10 41.7	18 40 31.34	-28 49 42.7	21.2	12.2	0.93
7	14 21.5	19 23 40.16	25 26 31.7	17.5	10.1	0.74	23	10 36.8	18 39 34.44	28 50 53.9	21.2	12.2	0.93
8	14 17.5	19 23 31.21	25 31 13.8	17.7	10.2	0.75	24	10 31.9	18 38 40.31	28 51 53.0	21.1	12.1	0.92
9	14 13.4	19 23 18.91	25 36 3.3	17.9	10.3	0.76	25	10 27.1	18 37 49.09	28 52 40.1	21.1	12.1	0.92
10	14 9.2	19 23 3.28	25 40 59.9	18.0	10.4	0.77	26	10 22.4	18 37 0.87	28 53 15.6	21.0	12.0	0.91
11	14 5.0	19 22 44.32	-25 46 3.4	18.2	10.5	0.78	27	10 17.7	18 36 15.74	-28 53 39.6	20.9	12.0	0.91
12	14 0.7	19 22 22.06	25 51 13.4	18.4	10.6	0.79	28	10 13.1	18 35 33.79	28 53 52.5	20.8	11.9	0.91
13	13 56.3	19 21 56.54	25 56 29.3	18.6	10.6	0.79	29	10 8.5	18 34 55.13	28 53 54.6	20.7	11.9	0.90
14	13 51.9	19 21 27.80	26 1 50.5	18.8	10.7	0.80	30	10 4.0	18 34 19.82	28 53 46.2	20.6	11.9	0.90
15	13 47.4	19 20 55.85	26 7 16.6	18.9	10.8	0.81	31	9 59.5	18 33 47.95	28 53 27.6	20.5	11.8	0.89
16	13 42.9	19 20 20.75	-26 12 47.3	19.1	10.9	0.82	Aug. 1	9 55.1	18 33 19.59	-28 52 58.9	20.4	11.7	0.89
17	13 38.3	19 19 42.55	26 18 21.9	19.2	11.0	0.83	2	9 50.8	18 32 54.80	28 52 20.7	20.2	11.6	0.88
18	13 33.7	19 19 1.33	26 23 59.9	19.4	11.1	0.83	3	9 46.5	18 32 33.63	28 51 33.1	20.1	11.5	0.88
19	13 29.0	19 18 17.13	26 29 40.7	19.6	11.2	0.84	4	9 42.3	18 32 16.16	28 50 36.6	20.0	11.5	0.88
20	13 24.3	19 17 30.03	26 35 23.6	19.7	11.3	0.85	5	9 38.1	18 32 2.41	28 49 31.4	19.8	11.4	0.87
21	13 19.5	19 16 40.12	-26 41 8.1	19.9	11.4	0.85	6	9 34.0	18 31 52.41	-28 48 17.8	19.7	11.3	0.86
22	13 14.7	19 15 47.49	26 46 53.4	20.0	11.5	0.86	7	9 30.0	18 31 46.19	28 46 56.1	19.5	11.3	0.86
23	13 9.9	19 14 52.22	26 52 38.8	20.1	11.5	0.86	8	9 26.0	18 31 43.76	28 45 26.6	19.4	11.2	0.85
24	13 5.0	19 13 54.42	26 58 23.6	20.3	11.6	0.87	9	9 22.1	18 31 45.13	28 43 49.7	19.3	11.2	0.84
25	13 0.1	19 12 54.17	27 4 7.1	20.4	11.7	0.88	10	9 18.3	18 31 50.31	28 42 5.5	19.2	11.1	0.84
26	12 55.1	19 11 51.61	-27 9 48.7	20.6	11.8	0.89	11	9 14.5	18 31 59.27	-28 40 14.4	19.0	11.0	0.83
27	12 50.1	19 10 46.83	27 15 27.3	20.7	11.8	0.89	12	9 10.7	18 32 11.98	28 38 16.5	18.9	10.9	0.83
28	12 45.0	19 9 39.99	27 21 2.2	20.8	11.9	0.90	13	9 7.0	18 32 28.45	28 36 12.0	18.7	10.8	0.82
29	12 39.9	19 8 31.20	27 26 32.9	20.9	12.0	0.90	14	9 3.4	18 32 48.68	28 34 1.1	18.6	10.7	0.81
30	12 34.8	19 7 20.60	27 31 58.5	21.0	12.0	0.90	15	8 59.9	18 33 12.60	28 31 43.9	18.5	10.6	0.81
July 1	12 29.7	19 6 8.35	-27 37 18.1	21.1	12.1	0.91	16	8 56.4	18 33 40.19	-28 29 20.7	18.3	10.5	0.80
2	12 24.6	19 4 54.64	27 42 31.2	21.2	12.1	0.91	17	8 53.0	18 34 11.40	28 26 51.5	18.2	10.4	0.79
3	12 19.4	19 3 39.66	27 47 36.9	21.3	12.1	0.92	18	8 49.7	18 34 46.16	28 24 16.5	18.0	10.3	0.78
4	12 14.2	19 2 23.60	27 52 34.4	21.3	12.2	0.92	19	8 46.5	18 35 24.42	28 21 35.6	17.9	10.3	0.77
5	12 9.0	19 1 6.64	27 57 23.0	21.4	12.2	0.92	20	8 43.3	18 36 6.09	28 18 49.0	17.7	10.2	0.77
6	12 3.7	18 59 49.00	-28 2 2.2	21.4	12.3	0.93	21	8 40.1	18 36 51.13	-28 15 56.8	17.6	10.1	0.76
7	11 58.4	18 58 30.90	28 6 31.3	21.5	12.3	0.93	22	8 36.9	18 37 39.47	28 12 58.9	17.4	10.0	0.75
8	11 53.2	18 57 12.55	28 10 49.9	21.5	12.4	0.94	23	8 33.8	18 38 31.06	28 9 55.4	17.3	9.9	0.75
9	11 48.0	18 55 54.17	28 14 57.5	21.5	12.4	0.94	24	8 30.8	18 39 25.83	28 6 46.0	17.2	9.9	0.75
10	11 42.8	18 54 35.99	28 18 53.6	21.5	12.4	0.94	25	8 27.8	18 40 23.73	28 3 30.9	17.0	9.8	0.74
11	11 37.6	18 53 18.24	-28 22 37.6	21.6	12.4	0.94	26	8 24.9	18 41 24.69	-28 0 9.9	16.8	9.7	0.74
12	11 32.4	18 52 1.14	28 26 9.5	21.6	12.4	0.94	27	8 22.0	18 42 28.67	27 56 43.2	16.7	9.6	0.73
13	11 27.2	18 50 44.91	28 29 28.9	21.6	12.4	0.94	28	8 19.2	18 43 35.59	27 53 10.6	16.5	9.5	0.72
14	11 22.0	18 49 29.76	28 32 35.6	21.6	12.4	0.94	29	8 16.4	18 44 45.41	27 49 32.1	16.4	9.5	0.72
15	11 16.9	18 48 15.90	28 35 29.2	21.5	12.4	0.94	30	8 13.7	18 45 58.09	27 45 47.6	16.3	9.4	0.71
16	11 11.8	18 47 3.55	-28 38 9.8	21.5	12.4	0.94	31	8 11.0	18 47 13.57	-27 41 57.0	16.1	9.3	0.70
17	11 6.7	18 45 52.90	-28 40 37.5	21.4	12.3	0.94	Sept. 1	8 8.4	18 48 31.78	-27 38 0.3	16.0	9.2	0.69

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Sept. 1	8 8.4	18 48 31.78	-27 38 0.3	16.0	9.2	0.69	Oct. 16	6 42.3	20 19 42.25	-22 26 8.6	10.9	6.3	0.45
2	8 5.8	18 49 52.67	27 33 57.3	15.8	9.1	0.68	17	6 40.9	20 22 10.13	22 15 44.0	10.8	6.2	0.45
3	8 3.3	18 51 16.19	27 29 47.9	15.7	9.0	0.67	18	6 39.4	20 24 38.55	22 5 9.8	10.8	6.2	0.45
4	8 0.8	18 52 42.30	27 25 32.0	15.5	9.0	0.67	19	6 37.9	20 27 7.48	21 54 26.0	10.7	6.1	0.44
5	7 58.3	18 54 10.94	27 21 9.6	15.4	8.9	0.66	20	6 36.4	20 29 36.87	21 43 32.7	10.6	6.1	0.44
6	7 55.9	18 55 42.06	-27 16 40.6	15.3	8.8	0.65	21	6 35.0	20 32 6.70	-21 32 30.0	10.5	6.0	0.43
7	7 53.5	18 57 15.59	27 12 4.9	15.1	8.7	0.65	22	6 33.6	20 34 36.95	21 21 17.9	10.4	6.0	0.43
8	7 51.2	18 58 51.48	27 7 22.3	15.0	8.6	0.64	23	6 32.1	20 37 7.60	21 9 56.4	10.4	6.0	0.43
9	7 48.9	19 0 29.68	27 2 32.7	14.9	8.5	0.64	24	6 30.7	20 39 38.63	20 58 25.6	10.3	5.9	0.42
10	7 46.6	19 2 10.12	26 57 36.0	14.8	8.5	0.63	25	6 29.3	20 42 10.03	20 46 45.5	10.2	5.9	0.42
11	7 44.4	19 3 52.76	-26 52 31.9	14.6	8.4	0.62	26	6 27.9	20 44 41.77	-20 34 56.2	10.1	5.8	0.41
12	7 42.2	19 5 37.53	26 47 20.5	14.5	8.3	0.62	27	6 26.5	20 47 13.84	20 22 57.6	10.0	5.7	0.41
13	7 40.0	19 7 24.38	26 42 1.6	14.4	8.2	0.61	28	6 25.1	20 49 46.21	20 10 49.9	9.9	5.7	0.41
14	7 37.9	19 9 13.23	26 36 35.3	14.3	8.2	0.61	29	6 23.7	20 52 18.86	19 58 33.1	9.9	5.6	0.40
15	7 35.8	19 11 4.02	26 31 1.4	14.2	8.1	0.60	30	6 22.3	20 54 51.79	19 46 7.3	9.8	5.6	0.40
16	7 33.7	19 12 56.68	-26 25 19.7	14.0	8.1	0.60	31	6 20.9	20 57 24.97	-19 33 32.7	9.7	5.5	0.39
17	7 31.7	19 14 51.14	26 19 30.0	13.9	8.0	0.59	Nov. 1	6 19.6	20 59 58.41	19 20 49.2	9.6	5.5	0.39
18	7 29.7	19 16 47.35	26 13 32.1	13.8	7.9	0.59	2	6 18.2	21 2 32.07	19 7 56.9	9.5	5.5	0.39
19	7 27.7	19 18 45.24	26 7 26.2	13.7	7.9	0.58	3	6 16.8	21 5 5.95	18 54 55.8	9.4	5.4	0.38
20	7 25.8	19 20 44.75	26 1 12.0	13.5	7.8	0.58	4	6 15.4	21 7 40.03	18 41 46.1	9.4	5.4	0.38
21	7 23.9	19 22 45.82	-25 54 49.5	13.4	7.7	0.57	5	6 14.0	21 10 14.30	-18 28 27.8	9.3	5.3	0.37
22	7 22.0	19 24 48.43	25 48 18.5	13.3	7.6	0.56	6	6 12.7	21 12 48.74	18 15 0.9	9.3	5.3	0.37
23	7 20.1	19 26 52.52	25 41 39.0	13.2	7.6	0.56	7	6 11.3	21 15 23.35	18 1 25.7	9.3	5.2	0.37
24	7 18.3	19 28 58.04	25 34 50.8	13.1	7.5	0.55	8	6 9.9	21 17 58.11	17 47 42.2	9.2	5.2	0.37
25	7 16.5	19 31 4.94	25 27 53.8	12.9	7.4	0.55	9	6 8.5	21 20 32.99	17 33 50.6	9.2	5.2	0.36
26	7 14.7	19 33 13.19	-25 20 47.9	12.8	7.4	0.54	10	6 7.2	21 23 7.98	-17 19 50.7	9.1	5.1	0.36
27	7 12.9	19 35 22.73	25 13 33.2	12.7	7.3	0.54	11	6 5.9	21 25 43.06	17 5 43.1	9.0	5.1	0.36
28	7 11.1	19 37 33.54	25 6 9.4	12.6	7.3	0.53	12	6 4.5	21 28 18.22	16 51 27.7	9.0	5.1	0.36
29	7 9.4	19 39 45.57	24 58 36.5	12.5	7.2	0.53	13	6 3.1	21 30 53.43	16 37 4.6	8.9	5.1	0.35
30	7 7.7	19 41 58.77	24 50 54.3	12.4	7.2	0.52	14	6 1.8	21 33 28.67	16 22 33.9	8.8	5.1	0.35
Oct. 1	7 6.0	19 44 13.12	-24 43 2.8	12.3	7.1	0.51	15	6 0.5	21 36 3.94	-16 7 55.8	8.7	5.0	0.34
2	7 4.3	19 46 28.58	24 35 2.0	12.2	7.0	0.51	16	5 59.2	21 38 39.24	15 53 10.4	8.6	5.0	0.34
3	7 2.6	19 48 45.13	24 26 51.8	12.1	7.0	0.51	17	5 57.8	21 41 14.54	15 38 17.9	8.5	5.0	0.34
4	7 0.9	19 51 2.73	24 18 32.2	12.0	6.9	0.50	18	5 56.5	21 43 49.83	15 23 18.5	8.4	4.9	0.34
5	6 59.3	19 53 21.34	24 10 3.1	11.9	6.8	0.50	19	5 55.2	21 46 25.11	15 8 12.2	8.4	4.9	0.34
6	6 57.7	19 55 40.93	-24 1 24.5	11.8	6.8	0.49	20	5 53.9	21 49 0.37	-14 52 59.1	8.3	4.8	0.33
7	6 56.1	19 58 1.45	23 52 36.4	11.7	6.7	0.49	21	5 52.5	21 51 35.59	14 37 39.5	8.3	4.8	0.33
8	6 54.5	20 0 22.87	23 43 38.6	11.7	6.7	0.49	22	5 51.2	21 54 10.79	14 22 13.4	8.3	4.8	0.33
9	6 52.9	20 2 45.15	23 34 31.2	11.6	6.6	0.48	23	5 49.9	21 56 45.94	14 6 40.9	8.2	4.7	0.33
10	6 51.3	20 5 8.25	23 25 14.1	11.5	6.6	0.48	24	5 48.5	21 59 21.06	13 51 2.2	8.2	4.7	0.33
11	6 49.8	20 7 32.15	-23 15 47.2	11.4	6.5	0.47	25	5 47.1	22 1 56.14	-13 35 17.4	8.1	4.6	0.32
12	6 48.3	20 9 56.81	23 6 10.9	11.3	6.4	0.47	26	5 45.7	22 4 31.17	13 19 26.5	8.1	4.6	0.32
13	6 46.8	20 12 22.18	22 56 24.8	11.2	6.4	0.47	27	5 44.4	22 7 6.15	13 3 29.9	8.1	4.6	0.32
14	6 45.3	20 14 48.24	22 46 29.0	11.1	6.4	0.46	28	5 43.1	22 9 41.09	12 47 27.6	8.0	4.6	0.32
15	6 43.8	20 17 14.95	22 36 23.6	11.0	6.3	0.46	29	5 41.7	22 12 15.96	12 31 19.6	8.0	4.5	0.32
16	6 42.3	20 19 42.25	-22 26 8.6	10.9	6.3	0.45	30	5 40.3	22 14 50.79	-12 15 6.2	7.9	4.5	0.31
17	6 40.9	20 22 10.13	22 15 44.0	10.8	6.2	0.45	Dec. 1	5 38.9	22 17 25.57	-11 58 47.4	7.8	4.5	0.31

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	11 45.3	6 24 3.15	+23 14 41.4	2.1	22.5	1.74	Feb. 15	8 25.4	6 5 3.47	+23 27 44.9	1.9	20.8	1.61
1	11 40.8	6 23 28.17	23 15 10.0	2.1	22.5	1.74	16	8 21.4	6 4 55.36	23 27 53.6	1.9	20.7	1.60
2	11 36.2	6 22 53.30	23 15 38.1	2.1	22.5	1.74	17	8 17.3	6 4 48.11	23 28 2.0	1.9	20.7	1.60
3	11 31.7	6 22 18.57	23 16 5.6	2.1	22.5	1.74	18	8 13.3	6 4 41.73	23 28 10.2	1.9	20.6	1.59
4	11 27.2	6 21 44.01	23 16 32.5	2.1	22.5	1.74	19	8 9.3	6 4 36.22	23 28 18.3	1.9	20.5	1.59
5	11 22.7	6 21 9.66	+23 16 58.9	2.1	22.5	1.74	20	8 5.3	6 4 31.57	+23 28 26.3	1.9	20.5	1.58
6	11 18.2	6 20 35.51	23 17 24.6	2.1	22.4	1.73	21	8 1.3	6 4 27.80	23 28 34.1	1.9	20.4	1.58
7	11 13.7	6 20 1.62	23 17 49.7	2.1	22.4	1.73	22	7 57.3	6 4 24.89	23 28 41.7	1.9	20.3	1.57
8	11 9.3	6 19 28.01	23 18 14.3	2.1	22.4	1.73	23	7 53.3	6 4 22.85	23 28 49.3	1.9	20.3	1.57
9	11 4.8	6 18 54.70	23 18 38.3	2.1	22.4	1.73	24	7 49.4	6 4 21.68	23 28 56.8	1.9	20.2	1.56
10	11 0.3	6 18 21.72	+23 19 1.8	2.1	22.4	1.73	25	7 45.4	6 4 21.37	+23 29 4.1	1.9	20.1	1.56
11	10 55.8	6 17 49.11	23 19 24.6	2.1	22.4	1.73	26	7 41.5	6 4 21.91	23 29 11.1	1.9	20.1	1.55
12	10 51.4	6 17 16.88	23 19 46.7	2.1	22.3	1.73	27	7 37.6	6 4 23.31	23 29 18.1	1.9	20.0	1.55
13	10 46.9	6 16 45.06	23 20 8.3	2.1	22.3	1.73	28	7 33.7	6 4 25.57	23 29 25.0	1.9	20.0	1.54
14	10 42.4	6 16 13.67	23 20 29.4	2.1	22.3	1.72	Mar. 1	7 29.8	6 4 28.69	23 29 31.6	1.9	19.9	1.54
15	10 38.0	6 15 42.72	+23 20 49.8	2.1	22.2	1.72	2	7 26.0	6 4 32.67	+23 29 38.1	1.9	19.9	1.53
16	10 33.5	6 15 12.25	23 21 9.7	2.1	22.2	1.72	3	7 22.1	6 4 37.49	23 29 44.5	1.8	19.8	1.53
17	10 29.1	6 14 42.27	23 21 29.1	2.1	22.2	1.71	4	7 18.3	6 4 43.15	23 29 50.8	1.8	19.7	1.52
18	10 24.7	6 14 12.80	23 21 47.9	2.1	22.1	1.71	5	7 14.5	6 4 49.64	23 29 56.8	1.8	19.7	1.52
19	10 20.3	6 13 43.87	23 22 6.2	2.1	22.1	1.71	6	7 10.7	6 4 56.97	23 30 2.6	1.8	19.6	1.51
20	10 15.9	6 13 15.51	+23 22 23.9	2.1	22.1	1.70	7	7 6.9	6 5 5.15	+23 30 8.3	1.8	19.5	1.51
21	10 11.5	6 12 47.74	23 22 41.1	2.1	22.0	1.70	8	7 3.1	6 5 14.16	23 30 13.8	1.8	19.5	1.50
22	10 7.1	6 12 20.58	23 22 57.8	2.1	22.0	1.70	9	6 59.3	6 5 24.00	23 30 19.2	1.8	19.4	1.50
23	10 2.7	6 11 54.04	23 23 14.0	2.1	22.0	1.70	10	6 55.5	6 5 34.65	23 30 24.4	1.8	19.4	1.49
24	9 58.4	6 11 28.10	23 23 29.9	2.0	21.9	1.69	11	6 51.8	6 5 46.14	23 30 29.4	1.8	19.3	1.49
25	9 54.0	6 11 2.79	+23 23 45.3	2.0	21.9	1.69	12	6 48.1	6 5 58.43	+23 30 34.1	1.8	19.2	1.48
26	9 49.6	6 10 38.15	23 24 0.2	2.0	21.8	1.69	13	6 44.4	6 6 11.53	23 30 38.6	1.8	19.2	1.48
27	9 45.3	6 10 14.20	23 24 14.6	2.0	21.8	1.69	14	6 40.7	6 6 25.44	23 30 42.9	1.8	19.1	1.47
28	9 41.0	6 9 50.95	23 24 28.6	2.0	21.7	1.68	15	6 37.0	6 6 40.15	23 30 46.9	1.8	19.0	1.47
29	9 36.7	6 9 28.41	23 24 42.3	2.0	21.7	1.68	16	6 33.3	6 6 55.65	23 30 50.7	1.8	19.0	1.46
30	9 32.4	6 9 6.58	+23 24 55.6	2.0	21.6	1.68	17	6 29.7	6 7 11.93	+23 30 54.2	1.8	18.9	1.46
31	9 28.1	6 8 45.48	23 25 8.4	2.0	21.6	1.67	18	6 26.0	6 7 28.99	23 30 57.5	1.8	18.9	1.45
Feb. 1	9 23.9	6 8 25.12	23 25 21.0	2.0	21.5	1.67	19	6 22.4	6 7 46.83	23 31 0.4	1.7	18.8	1.45
2	9 19.6	6 8 5.52	23 25 33.3	2.0	21.5	1.66	20	6 18.7	6 8 5.42	23 31 3.1	1.7	18.7	1.44
3	9 15.4	6 7 46.67	23 25 45.1	2.0	21.4	1.66	21	6 15.1	6 8 24.76	23 31 5.3	1.7	18.7	1.44
4	9 11.1	6 7 28.59	+23 25 56.5	2.0	21.4	1.66	22	6 11.5	6 8 44.85	+23 31 7.3	1.7	18.6	1.43
5	9 6.9	6 7 11.29	23 26 7.6	2.0	21.3	1.65	23	6 7.9	6 9 5.65	23 31 8.9	1.7	18.5	1.43
6	9 2.7	6 6 54.77	23 26 18.3	2.0	21.3	1.65	24	6 4.4	6 9 27.18	23 31 10.1	1.7	18.5	1.42
7	8 58.5	6 6 39.07	23 26 28.9	2.0	21.2	1.64	25	6 0.8	6 9 49.44	23 31 10.9	1.7	18.4	1.41
8	8 54.3	6 6 24.19	23 26 39.2	2.0	21.2	1.64	26	5 57.3	6 10 12.42	23 31 11.4	1.7	18.3	1.41
9	8 50.2	6 6 10.13	+23 26 49.3	2.0	21.1	1.63	27	5 53.7	6 10 36.14	+23 31 11.5	1.7	18.3	1.41
10	8 46.0	6 5 56.91	23 26 59.0	2.0	21.0	1.63	28	5 50.2	6 11 0.55	23 31 11.1	1.7	18.2	1.40
11	8 41.9	6 5 44.53	23 27 8.6	2.0	20.9	1.62	29	5 46.7	6 11 25.66	23 31 10.1	1.7	18.1	1.40
12	8 37.7	6 5 32.99	23 27 17.9	2.0	20.9	1.62	30	5 43.2	6 11 51.46	23 31 8.7	1.7	18.1	1.40
13	8 33.6	6 5 22.29	23 27 27.0	1.9	20.9	1.61	31	5 39.7	6 12 17.90	23 31 6.8	1.7	18.0	1.40
14	8 29.5	6 5 12.44	+23 27 36.0	1.9	20.8	1.61	Apr. 1	5 36.2	6 12 45.01	+23 31 4.4	1.7	18.0	1.39
15	8 25.4	6 5 3.47	+23 27 44.9	1.9	20.8	1.61	2	5 32.7	6 13 12.77	+23 31 1.5	1.7	17.9	1.39

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	5 36.2	6 12 45.01	+23 31 4.4	1.7	18.0	1.39	Nov. 16	17 22.5	9 3 45.50	+17 21 15.2	1.7	18.7	1.39
2	5 32.7	6 13 12.77	23 31 1.5	1.7	17.9	1.39	17	17 18.7	9 3 55.92	17 20 43.7	1.7	18.8	1.40
3	5 29.3	6 13 41.19	23 30 58.0	1.7	17.9	1.38	18	17 14.9	9 4 5.60	17 20 15.6	1.8	18.8	1.40
4	5 25.8	6 14 10.26	23 30 53.9	1.7	17.8	1.38	19	17 11.1	9 4 14.52	17 19 50.7	1.8	18.9	1.40
5	5 22.4	6 14 39.95	23 30 49.3	1.7	17.8	1.37	20	17 7.3	9 4 22.67	17 19 29.0	1.8	18.9	1.41
6	5 18.9	6 15 10.27	+23 30 44.0	1.7	17.7	1.37	21	17 3.5	9 4 30.07	+17 19 10.6	1.8	19.0	1.41
7	5 15.5	6 15 41.22	23 30 38.1	1.7	17.7	1.36	22	16 59.7	9 4 36.71	17 18 55.6	1.8	19.1	1.42
8	5 12.1	6 16 12.78	23 30 31.5	1.6	17.6	1.36	23	16 55.9	9 4 42.58	17 18 43.9	1.8	19.1	1.42
9	5 8.7	6 16 44.94	23 30 24.2	1.6	17.6	1.35	24	16 52.0	9 4 47.68	17 18 35.5	1.8	19.2	1.43
10	5 5.4	6 17 17.70	23 30 16.3	1.6	17.5	1.35	25	16 48.1	9 4 51.99	17 18 30.4	1.8	19.3	1.43
11	5 2.0	6 17 51.06	+23 30 7.7	1.6	17.5	1.34	26	16 44.3	9 4 55.53	+17 18 28.8	1.8	19.3	1.44
12	4 58.6	6 18 25.02	23 29 58.3	1.6	17.4	1.34	27	16 40.4	9 4 58.28	17 18 30.6	1.8	19.4	1.44
13	4 55.3	6 18 59.54	23 29 48.1	1.6	17.4	1.34	28	16 36.5	9 5 0.25	17 18 35.7	1.8	19.5	1.44
14	4 51.9	6 19 34.63	23 29 37.2	1.6	17.3	1.33	29	16 32.6	9 5 1.44	17 18 44.2	1.8	19.5	1.45
15	4 48.6	6 20 10.30	+23 29 25.6	1.6	17.2	1.33	30	16 28.7	9 5 1.84	17 18 56.2	1.8	19.6	1.45
Oct. 16	19 13.3	8 52 40.02	+18 1 8.2	1.6	17.1	1.28	Dec. 1	16 24.8	9 5 1.44	+17 19 11.6	1.8	19.7	1.46
17	19 9.8	8 53 10.86	17 59 14.6	1.6	17.1	1.28	2	16 20.8	9 5 0.25	17 19 30.4	1.8	19.7	1.46
18	19 6.4	8 53 41.14	17 57 22.9	1.6	17.2	1.29	3	16 16.8	9 4 58.24	17 19 52.6	1.8	19.8	1.47
19	19 3.0	8 54 10.86	17 55 33.2	1.6	17.2	1.29	4	16 12.8	9 4 55.45	17 20 18.2	1.9	19.8	1.47
20	18 59.5	8 54 40.01	17 53 45.6	1.6	17.3	1.30	5	16 8.8	9 4 51.87	17 20 47.2	1.9	19.9	1.48
21	18 56.1	8 55 8.58	+17 52 0.1	1.6	17.4	1.30	6	16 4.8	9 4 47.50	+17 21 19.7	1.9	19.9	1.48
22	18 52.6	8 55 36.56	17 50 16.8	1.6	17.4	1.30	7	16 0.8	9 4 42.34	17 21 55.6	1.9	20.0	1.49
23	18 49.1	8 56 3.95	17 48 35.8	1.6	17.5	1.31	8	15 56.8	9 4 36.37	17 22 34.9	1.9	20.1	1.49
24	18 45.6	8 56 30.74	17 46 57.0	1.6	17.5	1.31	9	15 52.7	9 4 29.62	17 23 17.5	1.9	20.1	1.50
25	18 42.1	8 56 56.93	17 45 20.6	1.6	17.6	1.31	10	15 48.6	9 4 22.10	17 24 3.4	1.9	20.2	1.50
26	18 38.6	8 57 22.50	+17 43 46.5	1.6	17.6	1.32	11	15 44.6	9 4 13.81	+17 24 52.6	1.9	20.2	1.51
27	18 35.1	8 57 47.45	17 42 14.8	1.6	17.7	1.32	12	15 40.5	9 4 4.74	17 25 45.1	1.9	20.3	1.51
28	18 31.6	8 58 11.78	17 40 45.6	1.6	17.7	1.32	13	15 36.4	9 3 54.90	17 26 40.9	1.9	20.3	1.51
29	18 28.0	8 58 35.47	17 39 18.9	1.7	17.8	1.33	14	15 32.3	9 3 44.30	17 27 39.8	1.9	20.4	1.52
30	18 24.5	8 58 58.52	17 37 54.7	1.7	17.8	1.33	15	15 28.2	9 3 32.94	17 28 41.9	1.9	20.4	1.52
31	18 20.9	8 59 20.92	+17 36 33.1	1.7	17.9	1.34	16	15 24.1	9 3 20.80	+17 29 47.2	1.9	20.5	1.53
Nov. 1	18 17.4	8 59 42.66	17 35 14.1	1.7	17.9	1.34	17	15 20.0	9 3 7.92	17 30 55.5	1.9	20.5	1.53
2	18 13.8	9 0 3.74	17 33 57.8	1.7	18.0	1.34	18	15 15.8	9 2 54.31	17 32 6.9	1.9	20.6	1.53
3	18 10.2	9 0 24.14	17 32 44.3	1.7	18.0	1.35	19	15 11.6	9 2 39.96	17 33 21.3	1.9	20.6	1.54
4	18 6.6	9 0 43.86	17 31 33.6	1.7	18.1	1.35	20	15 7.4	9 2 24.88	17 34 38.8	1.9	20.7	1.54
5	18 3.0	9 1 2.90	+17 30 25.7	1.7	18.1	1.35	21	15 3.2	9 2 9.08	+17 35 59.2	1.9	20.7	1.54
6	17 59.4	9 1 21.25	17 29 20.7	1.7	18.2	1.36	22	14 59.0	9 1 52.57	17 37 22.4	1.9	20.8	1.55
7	17 55.8	9 1 38.89	17 28 18.5	1.7	18.2	1.36	23	14 54.8	9 1 35.35	17 38 48.5	1.9	20.8	1.55
8	17 52.1	9 1 55.82	17 27 19.4	1.7	18.3	1.36	24	14 50.6	9 1 17.41	17 40 17.4	1.9	20.9	1.56
9	17 48.4	9 2 12.06	17 26 23.1	1.7	18.3	1.37	25	14 46.4	9 0 58.79	17 41 48.9	1.9	20.9	1.56
10	17 44.7	9 2 27.58	+17 25 29.9	1.7	18.4	1.37	26	14 42.1	9 0 39.48	+17 43 23.1	2.0	21.0	1.56
11	17 41.0	9 2 42.37	17 24 39.6	1.7	18.4	1.37	27	14 37.8	9 0 19.50	17 44 59.8	2.0	21.0	1.56
12	17 37.3	9 2 56.45	17 23 52.5	1.7	18.5	1.38	28	14 33.5	8 59 58.86	17 46 39.1	2.0	21.1	1.57
13	17 33.6	9 3 9.82	17 23 8.5	1.7	18.5	1.38	29	14 29.2	8 59 37.58	17 48 21.0	2.0	21.1	1.57
14	17 29.9	9 3 22.45	17 22 27.6	1.7	18.6	1.38	30	14 24.9	8 59 15.66	17 50 5.1	2.0	21.1	1.57
15	17 26.2	9 3 34.34	+17 21 49.8	1.7	18.6	1.39	31	14 20.6	8 58 53.10	+17 51 51.5	2.0	21.2	1.57
16	17 22.5	9 3 45.50	+17 21 15.2	1.7	18.7	1.39	32	14 16.3	8 58 29.95	+17 53 40.1	2.0	21.2	1.58

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 1	17 16.7	23 53 58.11	-3 2 9.4	0.9	8.4	0.59	Aug. 16	14 12.0	23 50 7.84	-3 39 22.7	1.0	8.9	0.64
2	17 12.8	23 54 1.13	3 2 7.5	0.9	8.4	0.59	17	14 7.9	23 49 55.31	3 40 56.4	1.0	9.0	0.64
3	17 9.0	23 54 3.78	3 2 7.9	0.9	8.4	0.60	18	14 3.8	23 49 42.53	3 42 31.5	1.0	9.0	0.64
4	17 5.1	23 54 6.07	3 2 10.6	0.9	8.4	0.60	19	13 59.6	23 49 29.51	3 44 7.9	1.0	9.0	0.64
5	17 1.2	23 54 7.98	3 2 15.8	0.9	8.4	0.60	20	13 55.5	23 49 16.25	3 45 45.5	1.0	9.0	0.64
6	16 57.2	23 54 9.52	-3 2 23.4	1.0	8.4	0.60	21	13 51.3	23 49 2.74	-3 47 24.4	1.0	9.0	0.64
7	16 53.3	23 54 10.70	3 2 33.4	1.0	8.4	0.60	22	13 47.1	23 48 49.01	3 49 4.6	1.0	9.0	0.64
8	16 49.4	23 54 11.50	3 2 45.9	1.0	8.4	0.60	23	13 43.0	23 48 35.06	3 50 45.9	1.0	9.0	0.64
9	16 45.5	23 54 11.92	3 3 0.6	1.0	8.4	0.60	24	13 38.8	23 48 20.90	3 52 28.4	1.0	9.0	0.64
10	16 41.6	23 54 11.97	3 3 17.7	1.0	8.5	0.61	25	13 34.6	23 48 6.53	3 54 11.9	1.0	9.0	0.64
11	16 37.6	23 54 11.66	-3 3 37.2	1.0	8.5	0.61	26	13 30.4	23 47 51.96	-3 55 56.4	1.0	9.0	0.64
12	16 33.7	23 54 10.98	3 3 59.1	1.0	8.5	0.61	27	13 26.3	23 47 37.20	3 57 41.9	1.0	9.0	0.65
13	16 29.7	23 54 9.92	3 4 23.3	1.0	8.5	0.61	28	13 22.1	23 47 22.24	3 59 28.3	1.0	9.1	0.65
14	16 25.8	23 54 8.50	3 4 49.9	1.0	8.5	0.61	29	13 17.9	23 47 7.10	4 1 15.6	1.0	9.1	0.65
15	16 21.8	23 54 6.71	3 5 18.9	1.0	8.5	0.61	30	13 13.7	23 46 51.80	4 3 3.6	1.0	9.1	0.65
16	16 17.9	23 54 4.55	-3 5 50.2	1.0	8.6	0.61	31	13 9.5	23 46 36.33	-4 4 52.4	1.0	9.1	0.65
17	16 13.9	23 54 2.03	3 6 23.7	1.0	8.6	0.61	Sept. 1	13 5.3	23 46 20.70	4 6 41.9	1.0	9.1	0.65
18	16 9.9	23 53 59.15	3 6 59.6	1.0	8.6	0.62	2	13 1.1	23 46 4.91	4 8 32.2	1.0	9.1	0.65
19	16 5.9	23 53 55.91	3 7 37.7	1.0	8.6	0.62	3	12 56.9	23 45 48.98	4 10 23.0	1.0	9.1	0.65
20	16 1.9	23 53 52.31	3 8 18.1	1.0	8.6	0.62	4	12 52.7	23 45 32.93	4 12 14.2	1.0	9.1	0.65
21	15 57.9	23 53 48.34	-3 9 0.7	1.0	8.6	0.62	5	12 48.5	23 45 16.76	-4 14 6.0	1.0	9.1	0.65
22	15 53.9	23 53 44.03	3 9 45.5	1.0	8.7	0.62	6	12 44.3	23 45 0.47	4 15 58.3	1.0	9.1	0.65
23	15 49.9	23 53 39.37	3 10 32.5	1.0	8.7	0.62	7	12 40.1	23 44 44.06	4 17 50.9	1.0	9.1	0.65
24	15 45.9	23 53 34.35	3 11 21.8	1.0	8.7	0.62	8	12 35.9	23 44 27.56	4 19 43.7	1.0	9.1	0.65
25	15 41.9	23 53 28.98	3 12 13.2	1.0	8.7	0.62	9	12 31.7	23 44 10.97	4 21 36.7	1.0	9.1	0.65
26	15 37.9	23 53 23.26	-3 13 6.8	1.0	8.7	0.62	10	12 27.5	23 43 54.30	-4 23 29.9	1.0	9.1	0.65
27	15 33.8	23 53 17.19	3 14 2.5	1.0	8.7	0.62	11	12 23.3	23 43 37.56	4 25 23.2	1.0	9.1	0.65
28	15 29.8	23 53 10.78	3 15 0.2	1.0	8.7	0.62	12	12 19.1	23 43 20.77	4 27 16.6	1.0	9.1	0.65
29	15 25.7	23 53 4.03	3 16 0.0	1.0	8.7	0.63	13	12 14.9	23 43 3.92	4 29 10.0	1.0	9.1	0.65
30	15 21.7	23 52 56.94	3 17 1.9	1.0	8.8	0.63	14	12 10.6	23 42 47.02	4 31 3.3	1.0	9.1	0.65
31	15 17.6	23 52 49.51	-3 18 5.8	1.0	8.8	0.63	15	12 6.4	23 42 30.09	-4 32 56.4	1.0	9.1	0.65
Aug. 1	15 13.6	23 52 41.74	3 19 11.8	1.0	8.8	0.63	16	12 2.2	23 42 13.14	4 34 49.3	1.0	9.1	0.65
2	15 9.5	23 52 33.63	3 20 19.8	1.0	8.8	0.63	17	11 58.0	23 41 56.18	4 36 42.0	1.0	9.1	0.65
3	15 5.4	23 52 25.20	3 21 29.7	1.0	8.8	0.63	18	11 53.8	23 41 39.20	4 38 34.5	1.0	9.1	0.65
4	15 1.4	23 52 16.46	3 22 41.6	1.0	8.8	0.63	19	11 49.6	23 41 22.23	4 40 26.5	1.0	9.1	0.65
5	14 57.3	23 52 7.40	-3 23 55.4	1.0	8.8	0.63	20	11 45.4	23 41 5.27	-4 42 18.0	1.0	9.1	0.65
6	14 53.2	23 51 58.02	3 25 11.1	1.0	8.8	0.63	21	11 41.2	23 40 48.33	4 44 9.1	1.0	9.1	0.65
7	14 49.1	23 51 48.33	3 26 28.6	1.0	8.9	0.63	22	11 37.0	23 40 31.40	4 45 59.8	1.0	9.1	0.65
8	14 45.0	23 51 38.33	3 27 47.9	1.0	8.9	0.63	23	11 32.8	23 40 14.51	4 47 49.8	1.0	9.1	0.65
9	14 40.9	23 51 28.02	3 29 9.0	1.0	8.9	0.63	24	11 28.6	23 39 57.67	4 49 39.1	1.0	9.1	0.65
10	14 36.8	23 51 17.41	-3 30 31.9	1.0	8.9	0.64	25	11 24.3	23 39 40.89	-4 51 27.8	1.0	9.1	0.65
11	14 32.7	23 51 6.51	3 31 56.4	1.0	8.9	0.64	26	11 20.1	23 39 24.18	4 53 15.7	1.0	9.1	0.65
12	14 28.6	23 50 55.33	3 33 22.5	1.0	8.9	0.64	27	11 15.9	23 39 7.53	4 55 2.8	1.0	9.1	0.65
13	14 24.4	23 50 43.87	3 34 50.2	1.0	8.9	0.64	28	11 11.7	23 38 50.95	4 56 48.9	1.0	9.1	0.65
14	14 20.3	23 50 32.13	3 36 19.5	1.0	8.9	0.64	29	11 7.5	23 38 34.47	4 58 34.1	1.0	9.1	0.65
15	14 16.2	23 50 20.12	-3 37 50.4	1.0	8.9	0.64	30	11 3.3	23 38 18.09	-5 0 18.4	1.0	9.1	0.65
16	14 12.0	23 50 7.84	-3 39 22.7	1.0	8.9	0.64	Oct. 1	10 59.1	23 38 1.81	-5 2 1.6	1.0	9.1	0.65

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m s	h m s	° ' "	"	"	s		h m s	h m s	° ' "	"	"	s
Oct. 1	10 59.1	23 38 1.81	-5 2 1.6	1.0	9.1	0.65	Nov. 16	7 49.9	23 29 41.26	-5 49 27.1	1.0	8.6	0.62
2	10 54.9	23 37 45.65	5 3 43.7	1.0	9.1	0.65	17	7 45.9	23 29 37.99	5 49 35.7	1.0	8.6	0.62
3	10 50.7	23 37 29.62	5 5 24.6	1.0	9.1	0.65	18	7 41.9	23 29 35.09	5 49 41.6	1.0	8.6	0.62
4	10 46.5	23 37 13.71	5 7 4.4	1.0	9.1	0.65	19	7 38.0	23 29 32.56	5 49 45.0	1.0	8.6	0.62
5	10 42.3	23 36 57.95	5 8 43.0	1.0	9.1	0.65	20	7 34.0	23 29 30.42	5 49 45.8	1.0	8.6	0.62
6	10 38.1	23 36 42.34	-5 10 20.2	1.0	9.1	0.65	21	7 30.0	23 29 28.68	-5 49 44.1	1.0	8.6	0.62
7	10 33.9	23 36 26.89	5 11 56.0	1.0	9.0	0.65	22	7 26.1	23 29 27.33	5 49 39.8	1.0	8.6	0.61
8	10 29.7	23 36 11.60	5 13 30.5	1.0	9.0	0.65	23	7 22.1	23 29 26.36	5 49 32.9	1.0	8.5	0.61
9	10 25.5	23 35 56.49	5 15 3.5	1.0	9.0	0.65	24	7 18.2	23 29 25.79	5 49 23.5	1.0	8.5	0.61
10	10 21.4	23 35 41.57	5 16 34.9	1.0	9.0	0.65	25	7 14.3	23 29 25.60	5 49 11.5	1.0	8.5	0.61
11	10 17.2	23 35 26.85	-5 18 4.7	1.0	9.0	0.65	26	7 10.3	23 29 25.80	-5 48 57.0	1.0	8.5	0.61
12	10 13.0	23 35 12.33	5 19 33.0	1.0	9.0	0.65	27	7 6.4	23 29 26.40	5 48 39.9	1.0	8.5	0.61
13	10 8.8	23 34 58.02	5 20 59.6	1.0	9.0	0.64	28	7 2.5	23 29 27.39	5 48 20.3	1.0	8.5	0.61
14	10 4.7	23 34 43.94	5 22 24.5	1.0	9.0	0.64	29	6 58.6	23 29 28.79	5 47 58.1	1.0	8.5	0.61
15	10 0.5	23 34 30.07	5 23 47.6	1.0	9.0	0.64	30	6 54.7	23 29 30.58	5 47 33.4	1.0	8.4	0.60
16	9 56.4	23 34 16.43	-5 25 8.8	1.0	9.0	0.64	Dec. 1	6 50.8	23 29 32.76	-5 47 6.2	0.9	8.4	0.60
17	9 52.2	23 34 3.03	5 26 28.3	1.0	9.0	0.64	2	6 46.9	23 29 35.34	5 46 36.4	0.9	8.4	0.60
18	9 48.1	23 33 49.89	5 27 45.9	1.0	9.0	0.64	3	6 43.0	23 29 38.31	5 46 3.9	0.9	8.4	0.60
19	9 43.9	23 33 37.00	5 29 1.6	1.0	9.0	0.64	4	6 39.2	23 29 41.68	5 45 29.0	0.9	8.4	0.60
20	9 39.8	23 33 24.37	5 30 15.3	1.0	8.9	0.64	5	6 35.3	23 29 45.44	5 44 51.6	0.9	8.4	0.60
21	9 35.6	23 33 11.99	-5 31 27.1	1.0	8.9	0.64	6	6 31.4	23 29 49.58	-5 44 11.7	0.9	8.4	0.60
22	9 31.5	23 32 59.89	5 32 36.9	1.0	8.9	0.63	7	6 27.6	23 29 54.12	5 43 29.3	0.9	8.3	0.60
23	9 27.4	23 32 48.06	5 33 44.7	1.0	8.9	0.63	8	6 23.7	23 29 59.06	5 42 44.3	0.9	8.3	0.60
24	9 23.3	23 32 36.52	5 34 50.5	1.0	8.9	0.63	9	6 19.9	23 30 4.39	5 41 56.8	0.9	8.3	0.59
25	9 19.2	23 32 25.26	5 35 54.2	1.0	8.9	0.63	10	6 16.0	23 30 10.10	5 41 6.9	0.9	8.3	0.59
26	9 15.0	23 32 14.30	-5 36 55.7	1.0	8.9	0.63	11	6 12.2	23 30 16.20	-5 40 14.5	0.9	8.3	0.59
27	9 10.9	23 32 3.64	5 37 55.0	1.0	8.9	0.63	12	6 8.4	23 30 22.69	5 39 19.7	0.9	8.3	0.59
28	9 6.8	23 31 53.29	5 38 52.2	1.0	8.9	0.63	13	6 4.6	23 30 29.56	5 38 22.4	0.9	8.3	0.59
29	9 2.7	23 31 43.25	5 39 47.1	1.0	8.9	0.63	14	6 0.8	23 30 36.81	5 37 22.7	0.9	8.2	0.59
30	8 58.6	23 31 33.52	5 40 39.7	1.0	8.8	0.63	15	5 57.0	23 30 44.44	5 36 20.7	0.9	8.2	0.59
31	8 54.5	23 31 24.12	-5 41 30.0	1.0	8.8	0.63	16	5 53.2	23 30 52.43	-5 35 16.2	0.9	8.2	0.59
Nov. 1	8 50.5	23 31 15.04	5 42 18.0	1.0	8.8	0.63	17	5 49.4	23 31 0.80	5 34 9.5	0.9	8.2	0.58
2	8 46.4	23 31 6.29	5 43 3.7	1.0	8.8	0.63	18	5 45.6	23 31 9.55	5 33 0.4	0.9	8.2	0.58
3	8 42.3	23 30 57.89	5 43 47.1	1.0	8.8	0.63	19	5 41.8	23 31 18.67	5 31 48.9	0.9	8.2	0.58
4	8 38.3	23 30 49.83	5 44 28.0	1.0	8.8	0.63	20	5 38.0	23 31 28.16	5 30 35.2	0.9	8.1	0.58
5	8 34.2	23 30 42.12	-5 45 6.5	1.0	8.8	0.63	21	5 34.2	23 31 38.00	-5 29 19.2	0.9	8.1	0.58
6	8 30.1	23 30 34.75	5 45 42.7	1.0	8.8	0.63	22	5 30.5	23 31 48.20	5 28 1.0	0.9	8.1	0.58
7	8 26.1	23 30 27.75	5 46 16.4	1.0	8.7	0.62	23	5 26.7	23 31 58.76	5 26 40.5	0.9	8.1	0.58
8	8 22.0	23 30 21.11	5 46 47.6	1.0	8.7	0.62	24	5 23.0	23 32 9.68	5 25 17.8	0.9	8.1	0.58
9	8 18.0	23 30 14.84	5 47 16.4	1.0	8.7	0.62	25	5 19.2	23 32 20.95	5 23 53.0	0.9	8.1	0.58
10	8 14.0	23 30 8.91	-5 47 42.7	1.0	8.7	0.62	26	5 15.5	23 32 32.57	-5 22 25.9	0.9	8.1	0.58
11	8 9.9	23 30 3.36	5 48 6.4	1.0	8.7	0.62	27	5 11.8	23 32 44.53	5 20 56.6	0.9	8.0	0.58
12	8 5.9	23 29 58.19	5 48 27.6	1.0	8.7	0.62	28	5 8.0	23 32 56.84	5 19 25.3	0.9	8.0	0.58
13	8 1.9	23 29 53.39	5 48 46.3	1.0	8.7	0.62	29	5 4.3	23 33 9.49	5 17 51.8	0.9	8.0	0.58
14	7 57.9	23 29 48.96	5 49 2.4	1.0	8.7	0.62	30	5 0.4	23 33 22.50	5 16 16.1	0.9	8.0	0.58
15	7 53.9	23 29 44.91	-5 49 16.0	1.0	8.6	0.62	31	4 56.9	23 33 35.85	-5 14 38.4	0.9	8.0	0.58
16	7 49.9	23 29 41.26	-5 49 27.1	1.0	8.6	0.62	32	4 53.2	23 33 49.53	-5 12 58.5	0.9	8.0	0.57



## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	18 16.3	18 54 57.60	-23 11 25.5	0.5	1.7	0.13	May 16	15 18.3	18 53 53.42	-23 13 56.8	0.5	1.8	0.13
2	18 12.4	18 55 0.93	23 11 22.6	0.5	1.7	0.13	17	15 14.3	18 53 47.37	23 14 6.0	0.5	1.8	0.13
3	18 8.6	18 55 4.05	23 11 20.0	0.5	1.7	0.13	18	15 10.3	18 53 41.14	23 14 15.3	0.5	1.8	0.13
4	18 4.7	18 55 6.94	23 11 17.7	0.5	1.7	0.13	19	15 6.2	18 53 34.74	23 14 24.8	0.5	1.8	0.13
5	18 0.8	18 55 9.61	23 11 15.7	0.5	1.7	0.13	20	15 2.2	18 53 28.17	23 14 34.5	0.5	1.8	0.13
6	17 56.9	18 55 12.06	-23 11 14.1	0.5	1.7	0.13	21	14 58.2	18 53 21.43	-23 14 44.3	0.5	1.8	0.13
7	17 53.0	18 55 14.29	23 11 12.9	0.5	1.7	0.13	22	14 54.1	18 53 14.54	23 14 54.3	0.5	1.8	0.13
8	17 49.1	18 55 16.30	23 11 11.9	0.5	1.7	0.13	23	14 50.1	18 53 7.50	23 15 4.5	0.5	1.8	0.13
9	17 45.2	18 55 18.09	23 11 11.1	0.5	1.7	0.13	24	14 46.0	18 53 0.31	23 15 14.9	0.5	1.8	0.13
10	17 41.3	18 55 19.65	23 11 10.6	0.5	1.7	0.13	25	14 41.9	18 52 52.96	23 15 25.5	0.5	1.8	0.13
11	17 37.4	18 55 20.98	-23 11 10.4	0.5	1.7	0.13	26	14 37.9	18 52 45.45	-23 15 36.2	0.5	1.8	0.13
12	17 33.5	18 55 22.09	23 11 10.7	0.5	1.7	0.13	27	14 33.8	18 52 37.81	23 15 47.0	0.5	1.8	0.13
13	17 29.6	18 55 22.98	23 11 11.1	0.5	1.7	0.13	28	14 29.8	18 52 30.02	23 15 58.0	0.5	1.8	0.13
14	17 25.7	18 55 23.65	23 11 11.8	0.5	1.7	0.13	29	14 25.7	18 52 22.09	23 16 9.1	0.5	1.8	0.13
15	17 21.7	18 55 24.11	23 11 12.6	0.5	1.7	0.13	30	14 21.6	18 52 14.02	23 16 20.3	0.5	1.8	0.13
16	17 17.8	18 55 24.33	-23 11 13.7	0.5	1.7	0.13	31	14 17.5	18 52 5.82	-23 16 31.7	0.5	1.8	0.13
17	17 13.8	18 55 24.33	23 11 15.2	0.5	1.7	0.13	June 1	14 13.5	18 51 57.48	23 16 43.2	0.5	1.8	0.13
18	17 9.9	18 55 24.13	23 11 17.1	0.5	1.7	0.13	2	14 9.4	18 51 49.01	23 16 54.8	0.5	1.8	0.13
19	17 6.0	18 55 23.70	23 11 19.3	0.5	1.7	0.13	3	14 5.3	18 51 40.42	23 17 6.5	0.5	1.8	0.13
20	17 2.0	18 55 23.05	23 11 21.8	0.5	1.7	0.13	4	14 1.3	18 51 31.71	23 17 18.3	0.5	1.8	0.13
21	16 58.1	18 55 22.19	-23 11 24.5	0.5	1.8	0.13	5	13 57.2	18 51 22.88	-23 17 30.1	0.5	1.8	0.13
22	16 54.1	18 55 21.12	23 11 27.5	0.5	1.8	0.13	6	13 53.1	18 51 13.93	23 17 42.1	0.5	1.8	0.13
23	16 50.2	18 55 19.82	23 11 30.7	0.5	1.8	0.13	7	13 49.0	18 51 4.87	23 17 54.1	0.5	1.8	0.13
24	16 46.2	18 55 18.31	23 11 34.2	0.5	1.8	0.13	8	13 44.9	18 50 55.71	23 18 6.3	0.5	1.8	0.13
25	16 42.3	18 55 16.58	23 11 38.0	0.5	1.8	0.13	9	13 40.8	18 50 46.45	23 18 18.6	0.5	1.8	0.13
26	16 38.3	18 55 14.64	-23 11 42.1	0.5	1.8	0.13	10	13 36.8	18 50 37.08	-23 18 31.0	0.5	1.8	0.13
27	16 34.3	18 55 12.50	23 11 46.5	0.5	1.8	0.13	11	13 32.7	18 50 27.61	23 18 43.4	0.5	1.8	0.13
28	16 30.4	18 55 10.14	23 11 51.1	0.5	1.8	0.13	12	13 28.6	18 50 18.06	23 18 55.8	0.5	1.8	0.13
29	16 26.4	18 55 7.58	23 11 55.9	0.5	1.8	0.13	13	13 24.5	18 50 8.42	23 19 8.3	0.5	1.8	0.13
30	16 22.4	18 55 4.81	23 12 1.1	0.5	1.8	0.13	14	13 20.4	18 49 58.70	23 19 20.8	0.5	1.8	0.13
May 1	16 18.4	18 55 1.83	-23 12 6.6	0.5	1.8	0.13	15	13 16.3	18 49 48.89	-23 19 33.3	0.5	1.8	0.13
2	16 14.4	18 54 58.64	23 12 12.3	0.5	1.8	0.13	16	13 12.2	18 49 39.01	23 19 45.9	0.5	1.8	0.13
3	16 10.5	18 54 55.25	23 12 18.2	0.5	1.8	0.13	17	13 8.1	18 49 29.06	23 19 58.5	0.5	1.8	0.13
4	16 6.5	18 54 51.66	23 12 24.4	0.5	1.8	0.13	18	13 4.0	18 49 19.04	23 20 11.1	0.5	1.8	0.13
5	16 2.5	18 54 47.88	23 12 30.8	0.5	1.8	0.13	19	12 59.9	18 49 8.97	23 20 23.7	0.5	1.8	0.13
6	15 58.5	18 54 43.89	-23 12 37.4	0.5	1.8	0.13	20	12 55.8	18 48 58.85	-23 20 36.3	0.5	1.8	0.13
7	15 54.5	18 54 39.71	23 12 44.3	0.5	1.8	0.13	21	12 51.7	18 48 48.66	23 20 48.9	0.5	1.8	0.13
8	15 50.5	18 54 35.33	23 12 51.5	0.5	1.8	0.13	22	12 47.6	18 48 38.42	23 21 1.6	0.5	1.8	0.13
9	15 46.5	18 54 30.74	23 12 58.9	0.5	1.8	0.13	23	12 43.5	18 48 28.14	23 21 14.3	0.5	1.8	0.13
10	15 42.5	18 54 25.97	23 13 6.5	0.5	1.8	0.13	24	12 39.4	18 48 17.82	23 21 26.9	0.5	1.8	0.13
11	15 38.4	18 54 21.01	-23 13 14.3	0.5	1.8	0.13	25	12 35.3	18 48 7.46	-23 21 39.5	0.5	1.8	0.13
12	15 34.4	18 54 15.86	23 13 22.4	0.5	1.8	0.13	26	12 31.2	18 47 57.06	23 21 52.1	0.5	1.8	0.13
13	15 30.4	18 54 10.52	23 13 30.7	0.5	1.8	0.13	27	12 27.1	18 47 46.64	23 22 4.6	0.5	1.8	0.13
14	15 26.4	18 54 5.00	23 13 39.2	0.5	1.8	0.13	28	12 23.0	18 47 36.20	23 22 17.1	0.5	1.8	0.13
15	15 22.4	18 53 59.30	23 13 47.9	0.5	1.8	0.13	29	12 18.9	18 47 25.74	23 22 29.6	0.5	1.8	0.13
16	15 18.3	18 53 53.42	-23 13 56.8	0.5	1.8	0.13	30	12 14.8	18 47 15.25	-23 22 42.0	0.5	1.8	0.13
17	15 14.3	18 53 47.37	23 14 6.0	0.5	1.8	0.13	July 1	12 10.7	18 47 4.74	-23 22 54.4	0.5	1.8	0.13

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 1	12 10.7	18 47 4.74	-23 22 54.4	0.5	1.8	0.13	Aug. 16	9 2.8	18 40 0.52	-23 30 19.1	0.5	1.8	0.13
2	12 6.6	18 46 54.23	23 23 6.7	0.5	1.8	0.13	17	8 58.7	18 39 54.02	23 30 25.0	0.5	1.8	0.13
3	12 2.5	18 46 43.71	23 23 18.9	0.5	1.8	0.13	18	8 54.7	18 39 47.70	23 30 30.7	0.5	1.8	0.13
4	11 58.4	18 46 33.19	23 23 31.1	0.5	1.8	0.13	19	8 50.6	18 39 41.55	23 30 36.2	0.5	1.8	0.13
5	11 54.2	18 46 22.68	23 23 43.2	0.5	1.8	0.13	20	8 46.6	18 39 35.57	23 30 41.5	0.5	1.8	0.13
6	11 50.1	18 46 12.18	-23 23 55.2	0.5	1.8	0.13	21	8 42.6	18 39 29.77	-23 30 46.6	0.5	1.8	0.13
7	11 46.0	18 46 1.70	23 24 7.2	0.5	1.8	0.13	22	8 38.6	18 39 24.16	23 30 51.5	0.5	1.8	0.13
8	11 41.9	18 45 51.23	23 24 19.1	0.5	1.8	0.13	23	8 34.5	18 39 18.72	23 30 56.2	0.5	1.8	0.13
9	11 37.8	18 45 40.78	23 24 30.9	0.5	1.8	0.13	24	8 30.5	18 39 13.46	23 31 0.7	0.5	1.8	0.13
10	11 33.7	18 45 30.36	23 24 42.6	0.5	1.8	0.13	25	8 26.5	18 39 8.37	23 31 5.0	0.5	1.8	0.13
11	11 29.6	18 45 19.97	-23 24 54.2	0.5	1.8	0.13	26	8 22.5	18 39 3.48	-23 31 9.1	0.5	1.8	0.13
12	11 25.5	18 45 9.60	23 25 5.8	0.5	1.8	0.13	27	8 18.5	18 38 58.79	23 31 13.0	0.5	1.8	0.13
13	11 21.4	18 44 59.28	23 25 17.3	0.5	1.8	0.13	28	8 14.5	18 38 54.29	23 31 16.7	0.5	1.8	0.13
14	11 17.3	18 44 49.01	23 25 28.6	0.5	1.8	0.13	29	8 10.5	18 38 49.99	23 31 20.2	0.5	1.8	0.13
15	11 13.2	18 44 38.78	23 25 39.7	0.5	1.8	0.13	30	8 6.5	18 38 45.87	23 31 23.5	0.5	1.8	0.13
16	11 9.1	18 44 28.60	-23 25 50.7	0.5	1.8	0.13	31	8 2.5	18 38 41.95	-23 31 26.6	0.5	1.8	0.13
17	11 5.0	18 44 18.48	23 26 1.6	0.5	1.8	0.13	Sept. 1	7 58.5	18 38 38.24	23 31 29.5	0.5	1.8	0.13
18	11 0.9	18 44 8.43	23 26 12.4	0.5	1.8	0.13	2	7 54.5	18 38 34.73	23 31 32.2	0.5	1.8	0.13
19	10 56.8	18 43 58.45	23 26 23.1	0.5	1.8	0.13	3	7 50.5	18 38 31.43	23 31 34.7	0.5	1.8	0.13
20	10 52.7	18 43 48.53	23 26 33.7	0.5	1.8	0.13	4	7 46.5	18 38 28.33	23 31 37.0	0.5	1.8	0.13
21	10 48.6	18 43 38.68	-23 26 44.2	0.5	1.8	0.13	5	7 42.5	18 38 25.43	-23 31 39.1	0.5	1.8	0.13
22	10 44.5	18 43 28.91	23 26 54.5	0.5	1.8	0.13	6	7 38.6	18 38 22.74	23 31 41.0	0.5	1.8	0.13
23	10 40.4	18 43 19.22	23 27 4.6	0.5	1.8	0.13	7	7 34.6	18 38 20.26	23 31 42.7	0.5	1.8	0.13
24	10 36.3	18 43 9.62	23 27 14.5	0.5	1.8	0.13	8	7 30.6	18 38 17.99	23 31 44.2	0.5	1.8	0.13
25	10 32.2	18 43 0.10	23 27 24.3	0.5	1.8	0.13	9	7 26.7	18 38 15.94	23 31 45.5	0.5	1.8	0.13
26	10 28.1	18 42 50.68	-23 27 34.0	0.5	1.8	0.13	10	7 22.7	18 38 14.10	-23 31 46.6	0.5	1.8	0.13
27	10 24.1	18 42 41.36	23 27 43.6	0.5	1.8	0.13	11	7 18.7	18 38 12.48	23 31 47.5	0.5	1.8	0.13
28	10 20.0	18 42 32.13	23 27 53.0	0.5	1.8	0.13	12	7 14.8	18 38 11.08	23 31 48.2	0.5	1.8	0.13
29	10 15.9	18 42 23.01	23 28 2.2	0.5	1.8	0.13	13	7 10.8	18 38 9.89	23 31 48.7	0.5	1.8	0.13
30	10 11.8	18 42 14.00	23 28 11.3	0.5	1.8	0.13	14	7 6.9	18 38 8.92	23 31 49.0	0.5	1.8	0.13
31	10 7.7	18 42 5.09	-23 28 20.2	0.5	1.8	0.13	15	7 2.9	18 38 8.16	-23 31 49.0	0.5	1.7	0.13
Aug. 1	10 3.6	18 41 56.29	23 28 29.0	0.5	1.8	0.13	16	6 59.0	18 38 7.62	23 31 48.8	0.5	1.7	0.13
2	9 59.6	18 41 47.61	23 28 37.6	0.5	1.8	0.13	17	6 55.0	18 38 7.30	23 31 48.5	0.5	1.7	0.13
3	9 55.5	18 41 39.06	23 28 46.0	0.5	1.8	0.13	18	6 51.1	18 38 7.21	23 31 48.0	0.5	1.7	0.13
4	9 51.4	18 41 30.63	23 28 54.2	0.5	1.8	0.13	19	6 47.2	18 38 7.33	23 31 47.3	0.5	1.7	0.13
5	9 47.4	18 41 22.32	-23 29 2.2	0.5	1.8	0.13	20	6 43.3	18 38 7.67	-23 31 46.4	0.5	1.7	0.13
6	9 43.3	18 41 14.15	23 29 10.1	0.5	1.8	0.13	21	6 39.3	18 38 8.24	23 31 45.3	0.5	1.7	0.13
7	9 39.2	18 41 6.12	23 29 17.8	0.5	1.8	0.13	22	6 35.4	18 38 9.02	23 31 43.9	0.5	1.7	0.13
8	9 35.2	18 40 58.23	23 29 25.4	0.5	1.8	0.13	23	6 31.5	18 38 10.02	23 31 42.3	0.5	1.7	0.13
9	9 31.1	18 40 50.48	23 29 32.8	0.5	1.8	0.13	24	6 27.6	18 38 11.24	23 31 40.5	0.5	1.7	0.13
10	9 27.1	18 40 42.88	-23 29 40.0	0.5	1.8	0.13	25	6 23.7	18 38 12.68	-23 31 38.5	0.5	1.7	0.13
11	9 23.0	18 40 35.43	23 29 47.0	0.5	1.8	0.13	26	6 19.8	18 38 14.35	23 31 36.4	0.5	1.7	0.13
12	9 18.9	18 40 28.13	23 29 53.8	0.5	1.8	0.13	27	6 15.9	18 38 16.24	23 31 34.1	0.5	1.7	0.13
13	9 14.9	18 40 20.98	23 30 0.4	0.5	1.8	0.13	28	6 12.0	18 38 18.35	23 31 31.5	0.5	1.7	0.13
14	9 10.8	18 40 14.00	23 30 6.8	0.5	1.8	0.13	29	6 8.1	18 38 20.68	23 31 28.7	0.5	1.7	0.13
15	9 6.8	18 40 7.18	-23 30 13.0	0.5	1.8	0.13	30	6 4.2	18 38 23.24	-23 31 25.7	0.5	1.7	0.13
16	9 2.8	18 40 0.52	-23 30 19.1	0.5	1.8	0.13	Oct. 1	6 0.3	18 38 26.02	-23 31 22.6	0.5	1.7	0.13

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	12 9.9	6 48 47.87	+22 3 59.0	0.3	1.3	0.10	Feb. 14	9 8.2	6 43 58.64	+22 10 20.5	0.3	1.3	0.09
1	12 5.9	6 48 40.58	22 4 8.1	0.3	1.3	0.10	15	9 4.2	6 43 54.02	22 10 27.4	0.3	1.3	0.09
2	12 1.8	6 48 33.30	22 4 17.2	0.3	1.3	0.10	16	9 0.2	6 43 49.51	22 10 34.1	0.3	1.3	0.09
3	11 57.8	6 48 26.02	22 4 26.3	0.3	1.3	0.10	17	8 56.2	6 43 45.11	22 10 40.7	0.3	1.3	0.09
4	11 53.8	6 48 18.75	22 4 35.4	0.3	1.3	0.10	18	8 52.2	6 43 40.82	22 10 47.2	0.3	1.3	0.09
5	11 49.8	6 48 11.49	+22 4 44.6	0.3	1.3	0.10	19	8 48.2	6 43 36.66	+22 10 53.6	0.3	1.3	0.09
6	11 45.8	6 48 4.23	22 4 53.7	0.3	1.3	0.10	20	8 44.2	6 43 32.62	22 10 59.9	0.3	1.3	0.09
7	11 41.7	6 47 56.98	22 5 2.8	0.3	1.3	0.10	21	8 40.2	6 43 28.70	22 11 6.1	0.3	1.3	0.09
8	11 37.7	6 47 49.74	22 5 12.0	0.3	1.3	0.10	22	8 36.2	6 43 24.90	22 11 12.2	0.3	1.3	0.09
9	11 33.6	6 47 42.52	22 5 21.2	0.3	1.3	0.10	23	8 32.2	6 43 21.22	22 11 18.1	0.3	1.3	0.09
10	11 29.5	6 47 35.33	+22 5 30.4	0.3	1.3	0.10	24	8 28.2	6 43 17.67	+22 11 23.9	0.3	1.3	0.09
11	11 25.5	6 47 28.15	22 5 39.5	0.3	1.3	0.10	25	8 24.2	6 43 14.25	22 11 29.6	0.3	1.3	0.09
12	11 21.4	6 47 21.00	22 5 48.6	0.3	1.3	0.10	26	8 20.2	6 43 10.97	22 11 35.2	0.3	1.3	0.09
13	11 17.4	6 47 13.88	22 5 57.7	0.3	1.3	0.10	27	8 16.2	6 43 7.81	22 11 40.7	0.3	1.3	0.09
14	11 13.3	6 47 6.79	22 6 6.8	0.3	1.3	0.10	28	8 12.3	6 43 4.78	22 11 46.1	0.3	1.3	0.09
15	11 9.3	6 46 59.75	+22 6 15.9	0.3	1.3	0.10	Mar. 1	8 8.3	6 43 1.89	+22 11 51.3	0.3	1.3	0.09
16	11 5.2	6 46 52.74	22 6 24.9	0.3	1.3	0.10	2	8 4.3	6 42 59.13	22 11 56.4	0.3	1.3	0.09
17	11 1.2	6 46 45.78	22 6 33.9	0.3	1.3	0.10	3	8 0.3	6 42 56.51	22 12 1.4	0.3	1.3	0.09
18	10 57.1	6 46 38.86	22 6 42.8	0.3	1.3	0.10	4	7 56.4	6 42 54.02	22 12 6.2	0.3	1.3	0.09
19	10 53.1	6 46 32.00	22 6 51.7	0.3	1.3	0.10	5	7 52.4	6 42 51.66	22 12 10.9	0.3	1.3	0.09
20	10 49.0	6 46 25.18	+22 7 0.6	0.3	1.3	0.10	6	7 48.4	6 42 49.43	+22 12 15.4	0.3	1.3	0.09
21	10 45.0	6 46 18.41	22 7 9.4	0.3	1.3	0.10	7	7 44.5	6 42 47.35	22 12 19.8	0.3	1.3	0.09
22	10 40.9	6 46 11.70	22 7 18.2	0.3	1.3	0.10	8	7 40.5	6 42 45.41	22 12 24.1	0.3	1.3	0.09
23	10 36.9	6 46 5.04	22 7 26.9	0.3	1.3	0.10	9	7 36.5	6 42 43.61	22 12 28.3	0.3	1.3	0.09
24	10 32.8	6 45 58.45	22 7 35.6	0.3	1.3	0.10	10	7 32.6	6 42 41.94	22 12 32.3	0.3	1.3	0.09
25	10 28.8	6 45 51.92	+22 7 44.2	0.3	1.3	0.10	11	7 28.6	6 42 40.43	+22 12 36.2	0.3	1.3	0.09
26	10 24.8	6 45 45.47	22 7 52.7	0.3	1.3	0.10	12	7 24.7	6 42 39.05	22 12 39.9	0.3	1.3	0.09
27	10 20.7	6 45 39.08	22 8 1.2	0.3	1.3	0.10	13	7 20.7	6 42 37.80	22 12 43.5	0.3	1.3	0.09
28	10 16.7	6 45 32.77	22 8 9.6	0.3	1.3	0.10	14	7 16.8	6 42 36.69	22 12 47.0	0.3	1.3	0.09
29	10 12.6	6 45 26.53	22 8 18.0	0.3	1.3	0.10	15	7 12.8	6 42 35.74	22 12 50.3	0.3	1.3	0.09
30	10 8.6	6 45 20.37	+22 8 26.2	0.3	1.3	0.10	16	7 8.9	6 42 34.93	+22 12 53.5	0.3	1.3	0.09
31	10 4.5	6 45 14.29	22 8 34.4	0.3	1.3	0.10	17	7 4.9	6 42 34.27	22 12 56.5	0.3	1.3	0.09
Feb. 1	10 0.5	6 45 8.29	22 8 42.5	0.3	1.3	0.10	18	7 1.0	6 42 33.75	22 12 59.4	0.3	1.3	0.09
2	9 56.5	6 45 2.37	22 8 50.5	0.3	1.3	0.10	19	6 57.0	6 42 33.39	22 13 2.1	0.3	1.3	0.09
3	9 52.5	6 44 56.53	22 8 58.5	0.3	1.3	0.10	20	6 53.1	6 42 33.17	22 13 4.7	0.3	1.3	0.09
4	9 48.4	6 44 50.78	+22 9 6.4	0.3	1.3	0.10	21	6 49.2	6 42 33.09	+22 13 7.2	0.3	1.3	0.09
5	9 44.4	6 44 45.12	22 9 14.2	0.3	1.3	0.10	22	6 45.2	6 42 33.16	22 13 9.5	0.3	1.3	0.09
6	9 40.4	6 44 39.55	22 9 22.0	0.3	1.3	0.10	23	6 41.3	6 42 33.38	22 13 11.7	0.3	1.3	0.09
7	9 36.3	6 44 34.08	22 9 29.7	0.3	1.3	0.10	24	6 37.4	6 42 33.74	22 13 13.7	0.3	1.3	0.09
8	9 32.3	6 44 28.71	22 9 37.3	0.3	1.3	0.09	25	6 33.4	6 42 34.24	22 13 15.6	0.3	1.3	0.09
9	9 28.3	6 44 23.44	+22 9 44.8	0.3	1.3	0.09	26	6 29.5	6 42 34.88	+22 13 17.3	0.3	1.3	0.09
10	9 24.3	6 44 18.27	22 9 52.1	0.3	1.3	0.09	27	6 25.6	6 42 35.68	22 13 18.9	0.3	1.3	0.09
11	9 20.3	6 44 13.20	22 9 59.3	0.3	1.3	0.09	28	6 21.7	6 42 36.62	22 13 20.3	0.3	1.3	0.09
12	9 16.2	6 44 8.24	22 10 6.4	0.3	1.3	0.09	29	6 17.8	6 42 37.70	22 13 21.6	0.3	1.3	0.09
13	9 12.2	6 44 3.39	22 10 13.5	0.3	1.3	0.09	30	6 13.8	6 42 38.92	22 13 22.8	0.3	1.3	0.09
14	9 8.2	6 43 58.64	+22 10 20.5	0.3	1.3	0.09	31	6 9.9	6 42 40.29	+22 13 23.8	0.3	1.3	0.09
15	9 4.2	6 43 54.02	+22 10 27.4	0.3	1.3	0.09	Apr. 1	6 6.0	6 42 41.80	+22 13 24.6	0.3	1.3	0.09

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	18 23.7	7 3 53.77	+21 48 16.6	0.3	1.3	0.09	Nov. 16	15 22.2	7 3 14.01	+21 48 30.0	0.3	1.3	0.09
2	18 19.8	7 3 56.11	21 48 12.0	0.3	1.3	0.09	17	15 18.2	7 3 9.96	21 48 35.4	0.3	1.3	0.09
3	18 15.9	7 3 58.30	21 48 7.5	0.3	1.3	0.09	18	15 14.2	7 3 5.80	21 48 41.0	0.3	1.3	0.09
4	18 12.0	7 4 0.35	21 48 3.1	0.3	1.3	0.09	19	15 10.1	7 3 1.52	21 48 46.8	0.3	1.3	0.09
5	18 8.1	7 4 2.26	21 47 59.0	0.3	1.3	0.09	20	15 6.1	7 2 57.12	21 48 52.7	0.3	1.3	0.09
6	18 4.2	7 4 4.02	+21 47 55.1	0.3	1.3	0.09	21	15 2.1	7 2 52.61	+21 48 58.8	0.3	1.3	0.09
7	18 0.3	7 4 5.65	21 47 51.5	0.3	1.3	0.09	22	14 58.1	7 2 47.98	21 49 5.1	0.3	1.3	0.09
8	17 56.4	7 4 7.13	21 47 48.2	0.3	1.3	0.09	23	14 54.1	7 2 43.24	21 49 11.6	0.3	1.3	0.09
9	17 52.5	7 4 8.46	21 47 45.1	0.3	1.3	0.09	24	14 50.1	7 2 38.40	21 49 18.3	0.3	1.3	0.09
10	17 48.6	7 4 9.65	21 47 42.1	0.3	1.3	0.09	25	14 46.1	7 2 33.45	21 49 25.2	0.3	1.3	0.09
11	17 44.7	7 4 10.70	+21 47 39.4	0.3	1.3	0.09	26	14 42.1	7 2 28.39	+21 49 32.2	0.3	1.3	0.09
12	17 40.8	7 4 11.60	21 47 36.8	0.3	1.3	0.09	27	14 38.1	7 2 23.23	21 49 39.4	0.3	1.3	0.09
13	17 36.9	7 4 12.36	21 47 34.4	0.3	1.3	0.09	28	14 34.1	7 2 17.98	21 49 46.7	0.3	1.3	0.09
14	17 32.9	7 4 12.97	21 47 32.3	0.3	1.3	0.09	29	14 30.1	7 2 12.62	21 49 54.2	0.3	1.3	0.09
15	17 29.0	7 4 13.44	21 47 30.5	0.3	1.3	0.09	30	14 26.0	7 2 7.16	21 50 1.9	0.3	1.3	0.09
16	17 25.1	7 4 13.76	+21 47 29.0	0.3	1.3	0.09	Dec. 1	14 22.0	7 2 1.61	+21 50 9.8	0.3	1.3	0.09
17	17 21.1	7 4 13.93	21 47 27.6	0.3	1.3	0.09	2	14 18.0	7 1 55.97	21 50 17.8	0.3	1.3	0.09
18	17 17.2	7 4 13.97	21 47 26.4	0.3	1.3	0.09	3	14 14.0	7 1 50.23	21 50 26.0	0.3	1.3	0.09
19	17 13.3	7 4 13.86	21 47 25.5	0.3	1.3	0.09	4	14 9.9	7 1 44.40	21 50 34.3	0.3	1.3	0.09
20	17 9.4	7 4 13.61	21 47 24.8	0.3	1.3	0.09	5	14 5.9	7 1 38.48	21 50 42.7	0.3	1.3	0.09
21	17 5.4	7 4 13.21	+21 47 24.4	0.3	1.3	0.09	6	14 1.9	7 1 32.48	+21 50 51.2	0.3	1.3	0.09
22	17 1.5	7 4 12.67	21 47 24.2	0.3	1.3	0.09	7	13 57.8	7 1 26.40	21 50 59.9	0.3	1.3	0.09
23	16 57.5	7 4 11.99	21 47 24.2	0.3	1.3	0.09	8	13 53.8	7 1 20.24	21 51 8.7	0.3	1.3	0.10
24	16 53.6	7 4 11.16	21 47 24.3	0.3	1.3	0.09	9	13 49.8	7 1 14.00	21 51 17.6	0.3	1.3	0.10
25	16 49.6	7 4 10.19	21 47 24.7	0.3	1.3	0.09	10	13 45.7	7 1 7.70	21 51 26.7	0.3	1.3	0.10
26	16 45.6	7 4 9.08	+21 47 25.3	0.3	1.3	0.09	11	13 41.7	7 1 1.32	+21 51 35.9	0.3	1.3	0.10
27	16 41.7	7 4 7.83	21 47 26.2	0.3	1.3	0.09	12	13 37.7	7 0 54.87	21 51 45.2	0.3	1.3	0.10
28	16 37.8	7 4 6.44	21 47 27.3	0.3	1.3	0.09	13	13 33.6	7 0 48.36	21 51 54.6	0.3	1.3	0.10
29	16 33.8	7 4 4.91	21 47 28.7	0.3	1.3	0.09	14	13 29.6	7 0 41.78	21 52 4.1	0.3	1.3	0.10
30	16 29.9	7 4 3.24	21 47 30.3	0.3	1.3	0.09	15	13 25.5	7 0 35.14	21 52 13.8	0.3	1.3	0.10
31	16 25.9	7 4 1.42	+21 47 32.1	0.3	1.3	0.09	16	13 21.5	7 0 28.44	+21 52 23.6	0.3	1.3	0.10
Nov. 1	16 21.9	7 3 59.46	21 47 34.1	0.3	1.3	0.09	17	13 17.5	7 0 21.69	21 52 33.4	0.3	1.3	0.10
2	16 17.9	7 3 57.36	21 47 36.3	0.3	1.3	0.09	18	13 13.4	7 0 14.89	21 52 43.3	0.3	1.3	0.10
3	16 14.0	7 3 55.13	21 47 38.7	0.3	1.3	0.09	19	13 9.4	7 0 8.05	21 52 53.2	0.3	1.3	0.10
4	16 10.0	7 3 52.76	21 47 41.3	0.3	1.3	0.09	20	13 5.3	7 0 1.15	21 53 3.2	0.3	1.3	0.10
5	16 6.0	7 3 50.26	+21 47 44.2	0.3	1.3	0.09	21	13 1.3	6 59 54.21	+21 53 13.4	0.3	1.3	0.10
6	16 2.1	7 3 47.61	21 47 47.3	0.3	1.3	0.09	22	12 57.2	6 59 47.23	21 53 23.7	0.3	1.3	0.10
7	15 58.1	7 3 44.83	21 47 50.6	0.3	1.3	0.09	23	12 53.2	6 59 40.20	21 53 34.0	0.3	1.3	0.10
8	15 54.1	7 3 41.92	21 47 54.1	0.3	1.3	0.09	24	12 49.1	6 59 33.14	21 53 44.4	0.3	1.3	0.10
9	15 50.1	7 3 38.87	21 47 57.8	0.3	1.3	0.09	25	12 45.1	6 59 26.05	21 53 54.8	0.3	1.3	0.10
10	15 46.1	7 3 35.69	+21 48 1.7	0.3	1.3	0.09	26	12 41.0	6 59 18.93	+21 54 5.3	0.3	1.3	0.10
11	15 42.1	7 3 32.39	21 48 5.9	0.3	1.3	0.09	27	12 37.0	6 59 11.78	21 54 15.8	0.3	1.3	0.10
12	15 38.2	7 3 28.97	21 48 10.3	0.3	1.3	0.09	28	12 32.9	6 59 4.61	21 54 26.4	0.3	1.3	0.10
13	15 34.2	7 3 25.42	21 48 15.0	0.3	1.3	0.09	29	12 28.9	6 58 57.42	21 54 37.0	0.3	1.3	0.10
14	15 30.2	7 3 21.73	21 48 19.8	0.3	1.3	0.09	30	12 24.8	6 58 50.20	21 54 47.7	0.3	1.3	0.10
15	15 26.2	7 3 17.93	+21 48 24.8	0.3	1.3	0.09	31	12 20.8	6 58 42.96	+21 54 58.4	0.3	1.3	0.10
16	15 22.2	7 3 14.01	+21 48 30.0	0.3	1.3	0.09	32	12 16.7	6 58 35.70	+21 55 9.1	0.3	1.3	0.10

PART III

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PHENOMENA

## ECLIPSES IN 1907.

In the year 1907 there will be four eclipses, two of the Sun and two of the Moon.  
I.—*A Total Eclipse of the Sun*, 1907, January 13, invisible at Washington.

## ELEMENTS OF THE ECLIPSE.

Greenwich mean time of $\delta$ in right ascension, January 13				<sup>d</sup> 13	<sup>h</sup> 18	<sup>m</sup> 12	<sup>s</sup> 0.7
Sun and Moon's R. A.	<sup>h</sup> 19	<sup>m</sup> 39	<sup>s</sup> 4.37	Hourly motions <sup>s</sup> 10.80 and <sup>s</sup> 159.95			
Sun's declination	<sup>°</sup> 21	<sup>'</sup> 29	<sup>"</sup> 52.5 S.	Hourly motion <sup>"</sup> 0 25.5 N.			
Moon's declination	<sup>°</sup> 20	<sup>'</sup> 37	<sup>"</sup> 23.6 S.	Hourly motion <sup>"</sup> 2 52.0 N.			
Sun's equa. hor. parallax	8.9			Sun's true semidiameter <sup>"</sup> 16 15.6			
Moon's equa. hor. parallax	<sup>"</sup> 60	<sup>"</sup> 50.4		Moon's true semidiameter <sup>"</sup> 16 33.9			

## CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.			Longitude from Greenwich.		Latitude.
	<sup>d</sup>	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>	<sup>'</sup>	<sup>"</sup>
Eclipse begins	January 13	15	53.0	46	0.8 E.	27 55.0 N.
Central eclipse begins		13	17 13.5	42	18.8 E.	50 25.8 N.
Central eclipse at local apparent noon		13	18 12.0	89	12.1 E.	38 40.3 N.
Central eclipse ends		13	18 57.8	130	49.3 E.	56 45.2 N.
Eclipse ends		13	20 18.4	131	28.9 E.	35 12.1 N.

II.—*A Partial Eclipse of the Moon*, 1907, January 28–29, partly visible at Washington, the Moon setting eclipsed; the beginning visible generally in North America, the Pacific Ocean, central and eastern Asia, and Australia; the end visible in northwest North America, the Pacific Ocean, Asia, Australia, central and eastern Europe.

## ELEMENTS OF THE ECLIPSE.

Greenwich mean time of $\delta$ in right ascension, January 29				<sup>d</sup> 29	<sup>h</sup> 1	<sup>m</sup> 26	<sup>s</sup> 25.0
Sun's right ascension	<sup>h</sup> 20	<sup>m</sup> 43	<sup>s</sup> 44.84	Hourly motion <sup>s</sup> 10.32			
Moon's right ascension	<sup>h</sup> 8	<sup>m</sup> 43	<sup>s</sup> 44.84	Hourly motion <sup>"</sup> 128.18			
Sun's declination	<sup>°</sup> 18	<sup>'</sup> 8	<sup>"</sup> 35.6 S.	Hourly motion <sup>"</sup> 0 39.7 N.			
Moon's declination	<sup>°</sup> 18	<sup>'</sup> 42	<sup>"</sup> 13.1 N.	Hourly motion <sup>"</sup> 5 16.3 S.			
Sun's equa. hor. parallax	8.9			Sun's true semidiameter <sup>"</sup> 16 14.2			
Moon's equa. hor. parallax	<sup>"</sup> 55	<sup>"</sup> 2.1		Moon's true semidiameter <sup>"</sup> 14 59.1			

## TIMES OF THE PHASES.

	<sup>d</sup>	<sup>h</sup>	<sup>m</sup>	} Greenwich Mean Time.
Moon enters penumbra	January 28	22	45.9	
Moon enters shadow		29	0 6.3	
Middle of the eclipse		29	1 38.1	
Moon leaves shadow		29	3 9.9	
Moon leaves penumbra		29	4 30.2	

## CIRCUMSTANCES OF THE ECLIPSE.

Contacts of shadow with Moon's limb.	Angles of position from the north point.	The Moon being in the zenith in longitude from Greenwich, and in latitude.	
	°	°	'
First	137 to E.	178	57 W. 18 49 N.
Last	118 to W.	136	41 E. 18 33 N.

Magnitude of the eclipse = 0.711 (Moon's diameter = 1.0).

III.—*An Annular Eclipse of the Sun, 1907, July 10, invisible at Washington.*

## ELEMENTS OF THE ECLIPSE.

Greenwich mean time of  $\delta$  in right ascension, July 10 3 26 40.1

Sun and Moon's R. A.	<sup>h</sup> 7 <sup>m</sup> 14 <sup>s</sup> 35.93	Hourly motions	<sup>s</sup> 10.23 and <sup>s</sup> 127.42
Sun's declination	22 20 33.9 N.	Hourly motion	0 18.2 S.
Moon's declination	21 46 33.8 N.	Hourly motion	1 3.5 S.
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 43.9
Moon's equa. hor. parallax	53 57.8	Moon's true semidiameter	14 41.6

## CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
Eclipse begins	July 10 0 34.8	88 32.8 W.	20 36.5 S.
Central eclipse begins	10 1 52.8	100 30.6 W.	34 32.4 S.
Central eclipse at local apparent noon	10 3 26.7	50 25.1 W.	16 57.5 S.
Central eclipse ends	10 4 56.4	1 7.0 W.	37 21.2 S.
Eclipse ends	10 6 14.4	12 38.4 W.	23 31.4 S.

IV.—*A Partial Eclipse of the Moon, 1907, July 24, visible at Washington; the beginning visible generally in central and western Europe, Africa, South America, and North America except the northwest portion; the end visible generally in western Africa, South America, and North America except the peninsula of Alaska.*

## ELEMENTS OF THE ECLIPSE.

Greenwich mean time of  $\delta$  in right ascension, July 24 16 13 36.8

Sun's right ascension	<sup>h</sup> 8 <sup>m</sup> 13 <sup>s</sup> 11.23	Hourly motion	<sup>s</sup> 9.91
Moon's right ascension	20 13 11.23	Hourly motion	160.79
Sun's declination	19 55 44.7 N.	Hourly motion	0 31.3 S.
Moon's declination	20 38 27.1 S.	Hourly motion	4 52.1 N.
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 44.8
Moon's equa. hor. parallax	61 10.8	Moon's true semidiameter	16 39.5

## TIMES OF THE PHASES.

Moon enters penumbra	July 24 13 58.7	} Greenwich Mean Time.
Moon enters shadow	24 15 3.7	
Middle of the eclipse	24 16 22.4	
Moon leaves shadow	24 17 41.1	
Moon leaves penumbra	24 18 46.2	

## CIRCUMSTANCES OF THE ECLIPSE.

Contacts of shadow with Moon's limb.	Angles of position from the north point.	The Moon being in the zenith in longitude from Greenwich,	and in latitude.
First	41 to E.	45 5 W.	20 44 S.
Last	55 to W.	82 48 W.	20 31 S.

Magnitude of the eclipse = 0.620 (Moon's diameter = 1.0).

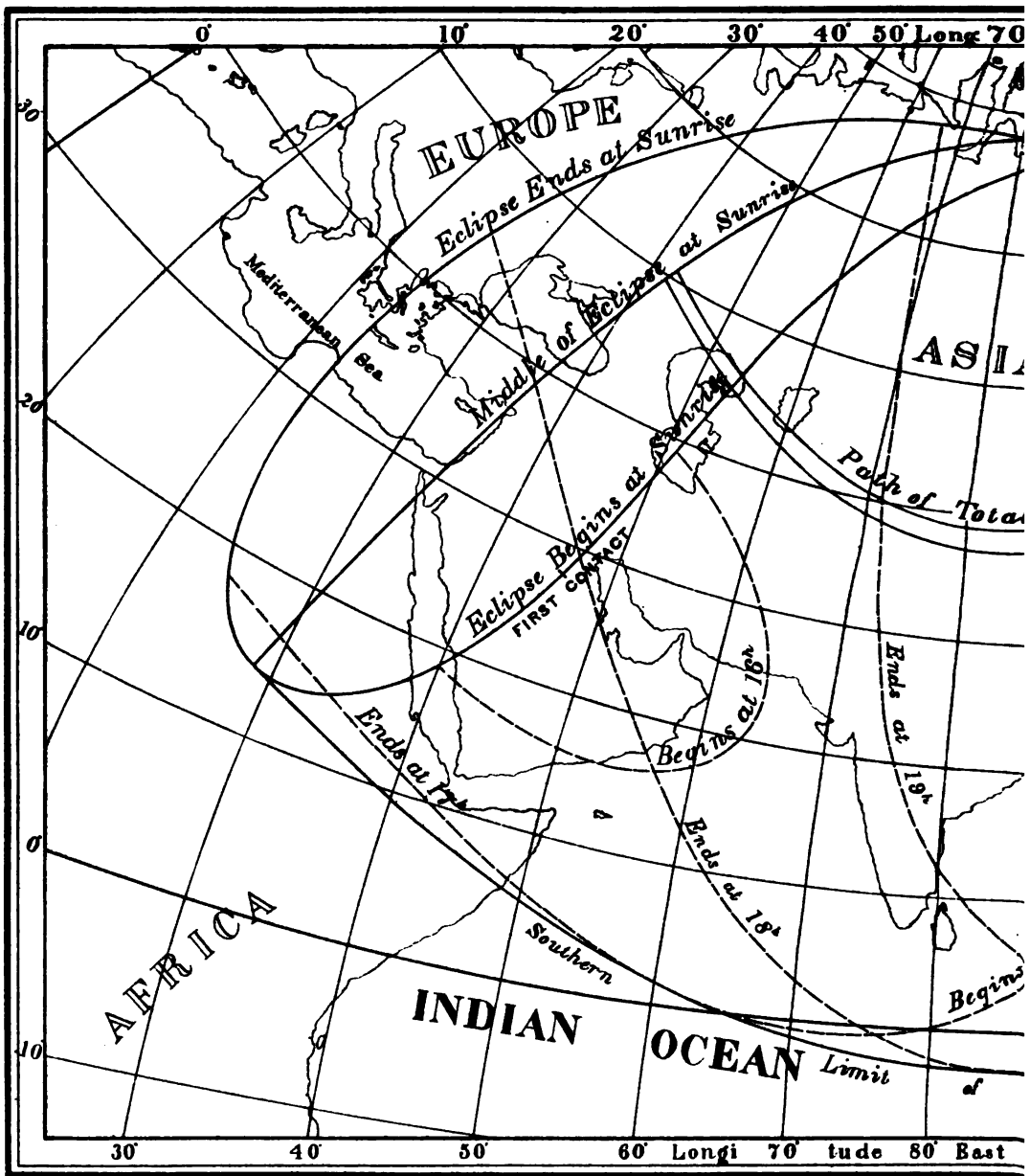
The regions within which the eclipses of the Sun are visible are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich times of beginning and ending at any place may be found with an uncertainty which will vary from three or four minutes for a high Sun, to fifteen or twenty minutes where the Sun is near the horizon.

BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN, 1907, JANUARY 13.							
Greenwich Mean Time.	Co-ordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	<i>x</i>	<i>y</i>	Log sin <i>d</i>	Log cos <i>d</i>	<i>μ</i>	<i>l</i> <sub>1</sub>	<i>l</i> <sub>2</sub>
h m							
15 50	−1.361 12	+0.769 57	−9.564 39	+9.968 63	235 18.0	+0.540 63	−0.005 26
16 0	−1.265 29	+0.776 23	−9.564 37	+9.968 63	237 48.0	+0.540 65	−0.005 24
10	1.169 45	0.782 90	9.564 35	9.968 64	240 18.0	0.540 67	0.005 22
20	1.073 61	0.789 57	9.564 33	9.968 64	242 48.0	0.540 69	0.005 20
30	0.977 76	0.796 24	9.564 30	9.968 64	245 17.9	0.540 71	0.005 19
40	0.881 92	0.802 93	9.564 28	9.968 65	247 47.9	0.540 73	0.005 17
50	0.786 07	0.809 62	9.564 26	9.968 65	250 17.9	0.540 74	0.005 15
17 0	−0.690 23	+0.816 31	−9.564 24	+9.968 65	252 47.9	+0.540 76	−0.005 13
10	0.594 38	0.823 01	9.564 21	9.968 66	255 17.8	0.540 77	0.005 12
20	0.498 53	0.829 72	9.564 19	9.968 66	257 47.8	0.540 79	0.005 10
30	0.402 68	0.836 44	9.564 17	9.968 66	260 17.8	0.540 80	0.005 09
40	0.306 83	0.843 16	9.564 15	9.968 67	262 47.8	0.540 81	0.005 08
50	0.210 98	0.849 88	9.564 13	9.968 67	265 17.7	0.540 83	0.005 06
18 0	−0.115 14	+0.856 62	−9.564 10	+9.968 67	267 47.7	+0.540 84	−0.005 05
10	−0.019 29	0.863 36	9.564 08	9.968 68	270 17.7	0.540 85	0.005 04
20	+0.076 56	0.870 10	9.564 06	9.968 68	272 47.7	0.540 86	0.005 03
30	0.172 40	0.876 85	9.564 04	9.968 68	275 17.6	0.540 87	0.005 02
40	0.268 24	0.883 61	9.564 01	9.968 69	277 47.6	0.540 88	0.005 01
50	0.364 09	0.890 38	9.563 99	9.968 69	280 17.6	0.540 89	0.005 01
19 0	+0.459 93	+0.897 15	−9.563 97	+9.968 69	282 47.6	+0.540 89	−0.005 00
10	0.555 76	0.903 92	9.563 95	9.968 70	285 17.5	0.540 90	0.004 99
20	0.651 60	0.910 71	9.563 92	9.968 70	287 47.5	0.540 91	0.004 99
30	0.747 43	0.917 50	9.563 90	9.968 70	290 17.5	0.540 91	0.004 98
40	0.843 26	0.924 29	9.563 88	9.968 71	292 47.5	0.540 92	0.004 98
50	0.939 09	0.931 09	9.563 86	9.968 71	295 17.4	0.540 92	0.004 97
20 0	+1.034 91	+0.937 90	−9.563 83	+9.968 72	297 47.4	+0.540 92	−0.004 97
10	1.130 73	0.944 71	9.563 81	9.968 72	300 17.4	0.540 92	0.004 97
20	+1.226 55	+0.951 53	−9.563 79	+9.968 72	302 47.4	+0.540 93	−0.004 97
Greenwich Mean Time.	Log <i>x'</i> for 1 Minute.		Log <i>y'</i> for 1 Minute.		Log <i>μ'</i> for 1 Minute.	Log Tangents of Angles of Cones.	
						Penumbra.	Shadow.
h m							
15 0	+ 7.9815		+ 6.8210		+ 1.1760	+ 7.677 01	+ 7.674 84
16 0	7.9815		6.8235		1.1760	7.677 01	7.674 84
17 0	7.9816		6.8260		1.1760	7.677 01	7.674 84
18 0	7.9816		6.8284		1.1760	7.677 01	7.674 84
19 0	7.9815		6.8308		1.1760	7.677 01	7.674 84
20 0	7.9815		6.8332		1.1760	7.677 01	7.674 84
21 0	+ 7.9813		+ 6.8355		+ 1.1760	+ 7.677 00	+ 7.674 84



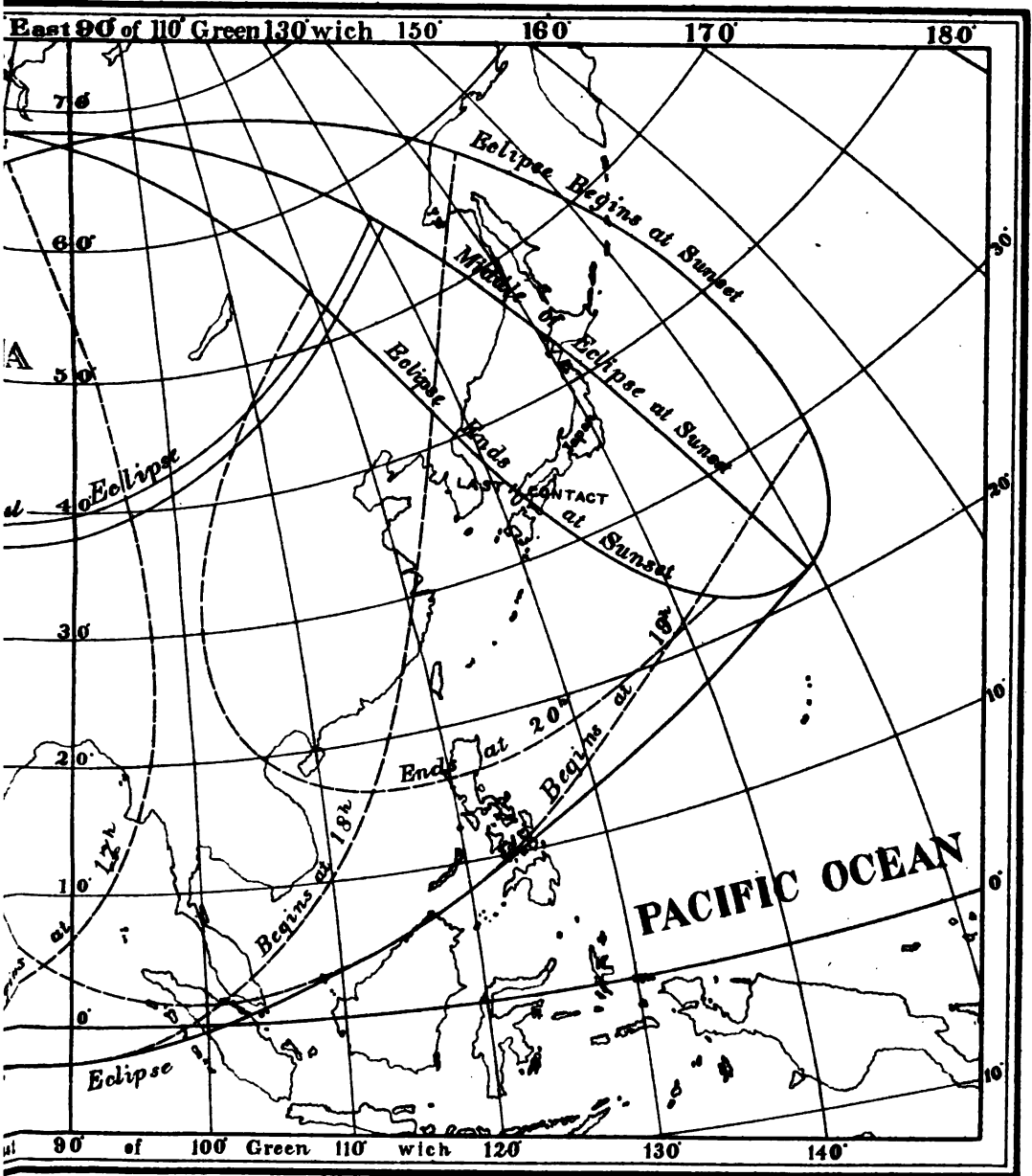


# TOTAL ECLIPSE



Note.~ The hours of beginning and ending

OF JAN. 13<sup>TH</sup> 1907.



...ing are expressed in Greenwich Mean Time.

THE MORRIS PUBLISHING CO., PHOTO-LITHO., WASHINGTON, D. C.



PATH OF THE SHADOW DURING THE TOTAL ECLIPSE  
OF THE SUN, 1907, JANUARY 13.

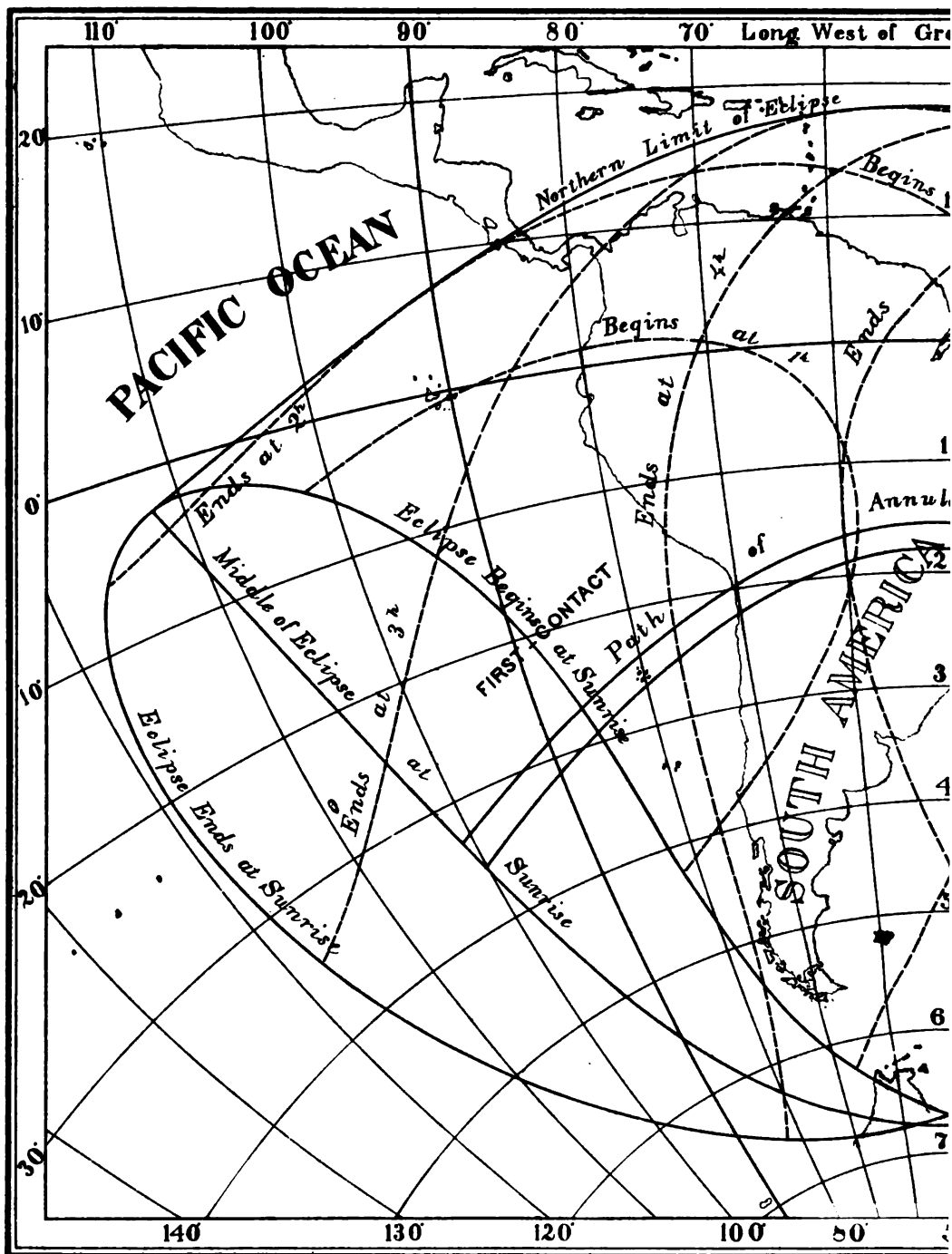
Greenwich Mean Time.	Northern Limit of Shadow Path.		Central Line.		Southern Limit of Shadow Path.		Duration of Totality on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
Limits.	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	m s
17 <sup>h</sup> 15 <sup>m</sup>	+ 50 44.6	42 33.0 E.	+ 50 25.8	42 18.8 E.	+ 49 48.0	41 56.5 E.	
	48 34.0	47 58.1	46 41.4	50 46.6	45 11.8	52 42.3	1 27.6
20	44 23.8	58 3.7	43 18.0	59 3.2	42 14.7	59 56.2	1 43.2
25	42 28.7	63 21.8	41 30.2	64 1.6	40 33.1	64 38.1	1 53.2
30	+ 41 13.1	67 23.2	+ 40 18.0	67 53.1	+ 39 23.7	68 20.9	2 1.1
35	40 20.3	70 44.9	39 26.7	71 8.9	38 34.0	71 31.1	2 7.5
40	39 42.8	73 42.8	38 50.4	74 2.2	37 58.5	74 20.7	2 12.6
45	39 17.3	76 24.8	38 25.7	76 40.8	37 34.3	76 56.2	2 16.6
50	39 2.0	78 56.0	38 10.7	79 9.4	37 19.7	79 22.0	2 19.7
55	38 55.5	81 20.1	38 4.3	81 31.1	37 13.6	81 41.3	2 21.9
18 0	+ 38 56.9	83 39.6	+ 38 5.8	83 48.2	+ 37 15.2	83 56.5	2 23.2
5	39 5.9	85 56.7	38 14.9	86 3.0	37 24.2	86 9.5	2 23.6
10	39 22.5	88 13.4	38 31.4	88 17.6	37 40.7	88 22.1	2 23.1
15	39 46.9	90 31.6	38 55.5	90 33.8	38 4.8	90 36.1	2 21.8
20	40 19.6	92 53.5	39 27.8	92 53.5	38 36.7	92 53.5	2 19.6
25	41 1.3	95 21.7	40 8.9	95 19.0	39 17.3	95 16.5	2 16.5
30	+ 41 53.2	97 59.6	+ 41 0.0	97 53.5	+ 40 7.7	97 48.1	2 12.4
35	42 57.4	100 51.8	42 3.2	100 41.4	41 9.8	100 32.3	2 7.3
40	44 17.8	104 5.1	43 21.9	103 49.4	42 26.6	103 35.0	2 1.2
45	46 1.2	107 53.3	45 1.5	107 28.8	44 3.4	107 6.8	1 53.7
50	48 21.9	112 45.5	47 15.5	112 5.0	46 11.6	111 29.2	1 44.3
55	52 18.2	120 35.0	50 46.3	119 0.7	49 24.2	117 46.3	1 31.1
Limits.	+ 57 0.1	130 29.9 E.	+ 56 45.2	130 49.3 E.	+ 56 10.0	131 26.2 E.	

**BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE  
OF THE SUN, 1907, JULY 10.**

Greenwich Mean Time.	Co-ordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	<i>x</i>	<i>y</i>	Log sin <i>d</i>	Log cos <i>d</i>	$\mu$	<i>l</i> <sub>1</sub>	<i>l</i> <sub>2</sub>
h m					°		
0 30	-1.48846	-0.59157	+9.58025	+9.96606	6 15.2	+0.56527	+0.01926
40	1.40422	0.59380	9.58024	9.96606	8 45.2	0.56528	0.01926
50	1.31998	0.59602	9.58022	9.96606	11 15.2	0.56528	0.01927
1 0	-1.23573	-0.59826	+9.58020	+9.96606	13 45.2	+0.56529	+0.01927
10	1.15149	0.60050	9.58019	9.96607	16 15.2	0.56529	0.01928
20	1.06724	0.60275	9.58017	9.96607	18 45.2	0.56530	0.01928
30	0.98298	0.60500	9.58016	9.96607	21 15.2	0.56530	0.01929
40	0.89873	0.60726	9.58014	9.96608	23 45.2	0.56531	0.01929
50	0.81448	0.60953	9.58013	9.96608	26 15.2	0.56531	0.01929
2 0	-0.73022	-0.61181	+9.58011	+9.96608	28 45.2	+0.56531	+0.01930
10	0.64597	0.61409	9.58010	9.96608	31 15.2	0.56531	0.01930
20	0.56171	0.61637	9.58008	9.96608	33 45.1	0.56531	0.01930
30	0.47745	0.61867	9.58007	9.96609	36 15.1	0.56531	0.01930
40	0.39320	0.62097	9.58005	9.96609	38 45.1	0.56531	0.01930
50	0.30894	0.62327	9.58003	9.96609	41 15.1	0.56531	0.01930
3 0	-0.22468	-0.62559	+9.58002	+9.96610	43 45.1	+0.56531	+0.01930
10	0.14042	0.62791	9.58000	9.96610	46 15.1	0.56531	0.01930
20	-0.05616	0.63023	9.57999	9.96610	48 45.1	0.56531	0.01930
30	+0.02810	0.63256	9.57997	9.96610	51 15.1	0.56531	0.01930
40	0.11236	0.63490	9.57996	9.96611	53 45.1	0.56531	0.01929
50	0.19662	0.63725	9.57994	9.96611	56 15.1	0.56530	0.01929
4 0	+0.28087	-0.63960	+9.57993	+9.96611	58 45.1	+0.56530	+0.01928
10	0.36513	0.64196	9.57991	9.96611	61 15.1	0.56529	0.01928
20	0.44939	0.64432	9.57990	9.96612	63 45.1	0.56529	0.01928
30	0.53364	0.64669	9.57988	9.96612	66 15.1	0.56528	0.01927
40	0.61790	0.64907	9.57986	9.96612	68 45.1	0.56528	0.01926
50	0.70215	0.65146	9.57985	9.96612	71 15.1	0.56527	0.01926
5 0	+0.78640	-0.65385	+9.57983	+9.96613	73 45.1	+0.56526	+0.01925
10	0.87065	0.65624	9.57982	9.96613	76 15.1	0.56526	0.01924
20	0.95490	0.65865	9.57980	9.96613	78 45.1	0.56525	0.01923
30	1.03914	0.66106	9.57979	9.96613	81 15.1	0.56524	0.01923
40	1.12338	0.66347	9.57977	9.96614	83 45.1	0.56523	0.01922
50	1.20763	0.66589	9.57976	9.96614	86 15.1	0.56522	0.01921
6 0	+1.29186	-0.66832	+9.57974	+9.96614	88 45.1	+0.56521	+0.01920
10	1.37610	0.67076	9.57973	9.96614	91 15.1	0.56520	0.01919
20	+1.46034	-0.67320	+9.57971	+9.96615	93 45.1	+0.56519	+0.01917
Greenwich Mean Time.	Log <i>x'</i> for 1 Minute.		Log <i>y'</i> for 1 Minute.		Log $\mu'$ for 1 Minute.		Log Tangents of Angles of Cones.
							Penumbra. Shadow.
h m							
0 0	+7.9255		-6.3423		+1.1761		+7.66274 +7.66057
1 0	7.9256		6.3499		1.1761		7.66274 7.66057
2 0	7.9256		6.3574		1.1761		7.66274 7.66057
3 0	7.9256		6.3648		1.1761		7.66274 7.66057
4 0	7.9256		6.3720		1.1761		7.66274 7.66057
5 0	7.9256		6.3790		1.1761		7.66274 7.66057
6 0	7.9255		6.3860		1.1761		7.66274 7.66057
7 0	+7.9254		-6.3927		+1.1761		+7.66274 +7.66057



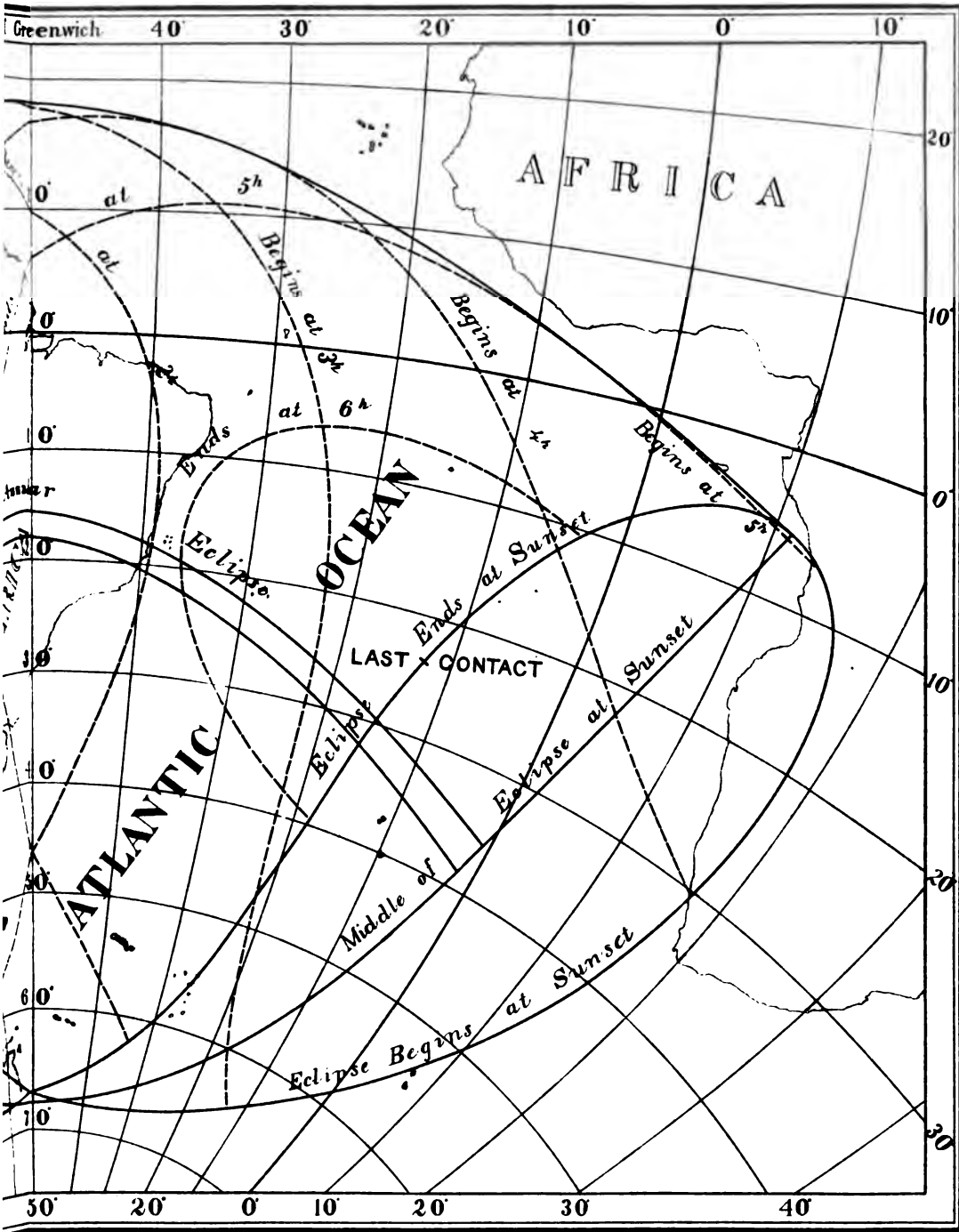
# ANNULAR ECLIPSE



Note, - The hours of beginning and ending are as follows:



**EOF JULY 10<sup>TH</sup> 1907.**



THE MORRIS PETER'S CO., PHOTO-LITHO., WASHINGTON, D. C.

Expressed in Greenwich Mean Time.



**PATH OF THE ANNULUS DURING THE ANNULAR ECLIPSE  
OF THE SUN, 1907, JULY 10.**

Greenwich Mean Time.	Northern Limit of Annulus Path.		Central Line.		Southern Limit of Annulus Path.		Duration of Annulus on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
Limits.	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	m s
1 <sup>h</sup> 55 <sup>m</sup>	- 33 15.3 27 58.1	100 55.3 W. 88 47.7	- 34 32.4 30 12.6	100 30.6 W. 90 45.0	- 35 45.2 33 11.5	100 3.5 W. 94 13.8	5 26.2
2 0	- 25 16.8	82 51.9	- 26 59.4	83 43.6	- 28 51.2	84 50.3	5 42.7
5	23 27.6	78 49.3	24 59.1	79 21.1	26 36.3	80 0.0	5 55.1
10	22 3.4	75 37.9	23 28.9	75 59.7	24 58.4	76 25.9	6 6.0
15	20 54.9	72 56.9	22 16.5	73 12.7	23 41.4	73 31.6	6 15.9
20	19 57.7	70 36.3	21 16.5	70 48.1	22 38.1	71 2.5	6 25.0
25	19 9.2	68 30.5	20 25.9	68 39.5	21 45.2	68 50.8	6 33.4
30	- 18 27.8	66 35.6	- 19 42.9	66 42.9	- 21 0.4	66 51.8	6 41.2
35	17 52.4	64 49.4	19 6.3	64 55.4	20 22.3	65 2.6	6 48.5
40	17 22.3	63 10.1	18 35.2	63 15.1	19 50.1	63 21.1	6 55.1
45	16 56.9	61 36.3	18 8.9	61 40.6	19 23.0	61 45.7	7 1.1
50	16 35.7	60 6.9	17 47.1	60 10.7	19 0.4	60 15.2	7 6.4
55	16 18.4	58 41.1	17 29.3	58 44.5	18 42.0	58 48.5	7 11.1
3 0	- 16 4.8	57 18.1	- 17 15.3	57 21.3	- 18 27.5	57 25.0	7 15.1
5	15 54.6	55 57.4	17 4.8	56 0.5	18 16.6	56 4.0	7 18.4
10	15 47.8	54 38.4	16 57.8	54 41.5	18 9.3	54 44.8	7 20.9
15	15 44.2	53 20.7	16 54.1	53 23.9	18 5.3	53 27.0	7 22.6
20	15 43.8	52 3.9	16 53.5	52 7.0	18 4.6	52 10.1	7 23.5
25	15 46.5	50 47.5	16 56.1	50 50.5	18 7.1	50 53.6	7 23.6
30	- 15 52.3	49 31.0	- 17 1.8	49 34.1	- 18 12.9	49 37.2	7 23.0
35	16 1.2	48 14.1	17 10.7	48 17.3	18 21.9	48 20.3	7 21.6
40	16 13.3	46 56.4	17 22.9	46 59.6	18 34.2	47 2.5	7 19.4
45	16 28.6	45 37.5	17 38.4	45 40.6	18 49.9	45 43.3	7 16.5
50	16 47.3	44 16.8	17 57.4	44 19.7	19 9.2	44 22.1	7 12.8
55	17 9.5	42 53.8	18 20.0	42 56.4	19 32.2	42 58.4	7 8.5
4 0	- 17 35.5	41 27.9	- 18 46.4	41 30.1	- 19 59.2	41 31.6	7 3.5
5	18 5.5	39 58.3	19 17.0	39 59.9	20 30.5	40 0.8	6 57.9
10	18 39.9	38 24.1	19 52.2	38 25.0	21 6.6	38 24.9	6 51.7
15	19 19.1	36 44.3	20 32.4	36 44.1	21 48.0	36 42.6	6 44.9
20	20 3.7	34 57.5	21 18.3	34 55.6	22 35.5	34 52.2	6 37.6
25	20 54.6	33 1.6	22 10.9	32 57.5	23 30.1	32 51.7	6 29.7
30	- 21 53.1	30 53.7	- 23 11.6	30 47.0	- 24 33.3	30 37.8	6 21.2
35	23 0.9	28 30.0	24 22.5	28 19.3	25 47.5	28 5.0	6 12.1
40	24 20.9	25 45.1	25 46.8	25 27.4	27 17.2	25 5.1	6 2.3
45	25 58.1	22 26.3	27 31.0	21 57.4	29 9.9	21 20.6	5 51.5
50	28 3.8	18 9.6	29 49.7	17 16.9	31 46.8	16 6.6	5 38.9
55	31 14.0	11 32.3	33 46.0	9 4.4	. . . .	. . . .	5 21.3
Limits.	- 36 4.7	0 39.7 W.	- 37 21.2	1 7.0 W.	- 38 32.6	1 37.3 W.	

*A Transit of Mercury, 1907.*—A Transit of Mercury over the Sun's Disk, November 13, partly visible at Washington, the Sun rising with Mercury on its Disk. The ingress will be visible generally in Europe, Africa, western and central Asia, western Australia, and South America; the egress in Europe except the northeast portion, Africa, western Asia, South America, and North America except the northwest portion.

*ELEMENTS OF THE TRANSIT.*

Greenwich mean time of conjunction in right ascension, November				d	h	m	s
				14	1	2	27
Sun and Mercury's R. A.				h	m	s	
				15	14	18.58	
Hourly motions				+10.22 and -12.67			
Sun's declination				°	'	"	S.
				18	1	7.0	S.
Hourly motion				°	'	"	S.
				0	39.8		S.
Mercury's declination				°	'	"	S.
				17	47	19.6	S.
Hourly motion				°	'	"	N.
				1	42.7		N.
Sun's equa. hor. parallax				8.90			
True semidiameter				16 10.15			
Mercury's equa. hor. parallax				13.00			
True semidiameter				4.94			

Greenwich mean times of the geocentric phases.

Ingress, exterior contact				d	h	m	s
				November	13	22	23 39.9
Ingress, interior contact					13	22	26 19.3
Least distance of centers, 12' 38".4					14	0	6 47.7
Egress, interior contact					14	1	47 18.3
Egress, exterior contact					14	1	49 57.8

*CIRCUMSTANCES OF THE TRANSIT.*

	Angles of position from the north point.		Mercury being in the astronomical zenith in longitude from Greenwich.		and in latitude.	
	°	'	°	'	°	'
Ingress, exterior contact	62	30 E.	20	26 E.	17	52 S.
Ingress, interior contact	61	46 E.	19	46 E.	17	52 S.
Least distance of centers			5	31 W.	17	49 S.
Egress, interior contact	14	39 W.	30	48 W.	17	46 S.
Egress, exterior contact	15	23 W.	31	28 W.	17	46 S.

The Greenwich mean times of the four contacts for any point on the surface of the earth may be computed from the four following formulæ, respectively, in which  $\rho$  denotes the radius of the earth at that point,  $\phi'$  the geocentric north latitude, and  $\lambda$  the longitude *west* from Greenwich. The numbers in brackets are the logarithms of the respective coefficients.

$$\begin{aligned}
 \text{Ing. ext. } T^I &= 22 \ 23 \ 39.9 - [1.4665] \rho \sin \phi' - [1.7723] \rho \cos \phi' \cos (258 \ 2.7 - \lambda) \\
 \text{Ing. int. } T^{II} &= 22 \ 26 \ 19.3 - [1.4837] \rho \sin \phi' - [1.7767] \rho \cos \phi' \cos (258 \ 59.7 - \lambda) \\
 \text{Eg. int. } T^{III} &= 1 \ 47 \ 18.3 + [1.7922] \rho \sin \phi' + [1.4077] \rho \cos \phi' \cos (72 \ 18.5 - \lambda) \\
 \text{Eg. ext. } T^{IV} &= 1 \ 49 \ 57.8 + [1.7838] \rho \sin \phi' + [1.4091] \rho \cos \phi' \cos (74 \ 26.7 - \lambda)
 \end{aligned}$$

## WASHINGTON MEAN TIME.

## PHASES OF THE MOON.

New Moon.				First Quarter.				Full Moon.				Last Quarter.			
	d	h	m		d	h	m		d	h	m		d	h	m
January	13	12	48.7	January	20	15	33.7	January	28	20	36.8	January	6	21	39.2
February	12	0	34.6	February	19	11	26.6	February	27	13	14.5	February	5	7	43.5
March	13	12	56.5	March	21	8	1.5	March	29	2	36.1	March	6	15	33.5
April	12	1	57.5	April	20	3	29.7	April	27	12	56.5	April	4	22	12.2
May	11	15	51.0	May	19	20	19.2	May	26	21	9.5	May	4	4	45.2
June	10	6	41.6	June	18	9	46.7	June	25	4	18.7	June	2	12	11.3
July	9	22	8.8	July	17	20	3.3	July	24	11	21.2	July	1	21	25.6
August	8	13	28.1	August	16	3	57.2	August	22	19	6.8	July	31	9	17.2
September	7	3	55.7	September	14	10	31.8	September	21	4	25.4	August	30	0	19.6
October	6	17	12.3	October	13	16	53.7	October	20	16	8.2	September	28	18	28.8
November	5	5	30.6	November	12	0	6.1	November	19	6	56.0	October	28	14	43.2
December	4	17	14.1	December	11	9	7.7	December	19	0	46.8	November	27	11	12.7
												December	27	6	2.2

## APOGEE, PERIGEE, AND GREATEST LIBRATION.

Apogee.		Perigee.		Greatest Libration.	
	d h		d h		d h
January	24 13.0	January	12 9.4	January	5 22.4 E.
February	21 7.8	February	9 14.0	February	2 6.2 E.
March	21 4.5	March	8 15.2	February	28 9.6 E.
April	18 0.2	April	2 11.5	March	27 8.2 E.
May	15 16.1	April	29 20.4	April	24 1.5 E.
June	12 2.0	May	28 0.2	May	22 3.3 E.
July	9 5.2	June	25 9.2	June	19 8.2 E.
August	5 11.5	July	23 18.9	July	17 11.8 E.
September	2 1.7	August	21 1.7	August	14 7.1 E.
September	29 19.9	September	17 22.1	September	10 2.2 E.
October	27 16.1	October	13 21.2	October	6 9.8 E.
November	24 12.7	November	8 12.9	November	2 16.8 E.
December	22 4.3	December	6 9.6	November	30 15.7 E.
				December	28 22.2 E.

## FORMULÆ FOR THE LIBRATION OF THE MOON.

Let  $I$  = the inclination of the Moon's equator to the ecliptic ( $= 1^\circ 28' 8''$ ),

$\Omega$  = the mean longitude of the Moon's ascending node, or the mean longitude of the descending node of the Moon's equator,

$C$  = the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

$\lambda, \beta, \alpha, \delta$  = the apparent longitude, latitude, right ascension, and declination of the Moon, corrected for parallax,

$\lambda'$  = the selenocentric longitude of the Earth, counted on the Moon's equator from its descending node,  $\Omega$ ,

$i, \Delta, \Omega', \zeta$  = the quantities defined on page 284, where their values for the current year are given.

The Moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 284 and 285:—

$$\left. \begin{aligned} \mu &= -0'.574 \sin 2(\Omega - \lambda) \\ A &= \sin I \cos (\Omega - \lambda) \\ \tan B &= \tan I \sin (\Omega - \lambda) \\ \lambda' &= \lambda + \mu + Ab \end{aligned} \right\} \text{ See table, page 285.}$$

$$\text{The libration in latitude} = b = B - \beta$$

$$\text{The libration in longitude} = l = \lambda' - \zeta$$

$$\sin C = \sin i \frac{\cos (\lambda' + \Delta - \Omega)}{\cos \delta} = - \sin i \frac{\cos (\alpha - \Omega')}{\cos \delta}$$

MEAN PLACES FOR 1907.0. (January 0<sup>d</sup>.795, Washington.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ' "	"
Piazzi 0 <sup>h</sup> 1.	6.0	0 5 33.193	+ 0.0020	— 5 45 54.44	0.000
B. A. C. 81	6.3	0 19 44.524	— 0.0024	2 44 0.68	— 0.051
14 Ceti	5.4	0 30 46.344	+ 0.0098	1 0 59.24	— 0.059
20 Ceti	4.9	0 48 15.234	— 0.0005	— 1 38 56.42	— 0.003
26 Ceti	6.0	0 59 1.814	+ 0.0081	+ 0 52 6.77	— 0.037
33 Ceti	6.1	1 5 46.345	— 0.0010	+ 1 57 3.30	— 0.006
Lalande 2632	6.5	1 22 5.081	....	3 3 11.29	....
Piazzi i, 249	6.5	1 59 56.644	+ 0.0025	7 17 23.03	— 0.032
64 Ceti	5.8	2 6 26.408	— 0.0092	8 8 5.15	— 0.107
ξ Arietis	5.5	2 19 49.805	+ 0.0006	10 11 22.86	— 0.022
25 Arietis	6.5	2 22 26.498	— 0.0195	+ 9 47 9.18	— 0.200
B. F. 310	6.3	2 24 37.288	— 0.0003	9 9 2.70	— 0.003
85 Ceti	6.3	2 37 28.364	— 0.0026	10 20 44.26	— 0.012
μ Ceti	4.3	2 39 54.763	+ 0.0188	9 43 18.88	— 0.025
W. B. ii, 1033	5.8	3 1 17.280	+ 0.0017	12 49 45.82	— 0.009
B. D. + 12°, 473	6.2	3 19 2.969	....	+ 12 18 0.38	....
Mayer 121	6.4	3 32 34.502	+ 0.0015	15 7 32.49	— 0.036
Piazzi iii, 103	6.3	3 34 10.032	+ 0.0028	16 14 4.86	— 0.026
Mayer 136	5.9	3 47 50.814	+ 0.0085	17 3 2.05	— 0.036
B. A. C. 1239	6.3	3 55 18.001	— 0.0003	17 2 3.71	— 0.061
B. D. + 14°, 657	5.9	4 2 26.082	+ 0.0104	+ 14 54 51.24	— 0.043
Piazzi iii, 249	6.1	4 2 39.847	+ 0.0032	17 5 30.04	— 0.022
B. D. + 16°, 569	6.2	4 7 11.102	+ 0.0004	17 2 19.12	— 0.015
B. D. + 18°, 624	6.0	4 15 0.682	+ 0.0055	18 31 13.25	....
δ <sup>1</sup> Tauri	3.9	4 17 34.190	+ 0.0076	17 19 29.60	— 0.030
63 Tauri	5.7	4 18 4.788	+ 0.0074	+ 16 33 38.38	— 0.027
δ <sup>2</sup> Tauri	4.9	4 18 44.007	+ 0.0084	17 13 44.55	— 0.039
B. A. C. 1361	6.0	4 19 31.816	+ 0.0072	18 49 42.45	— 0.060
δ <sup>3</sup> Tauri	4.3	4 20 6.420	+ 0.0078	17 42 56.26	— 0.031
75 Tauri	5.2	4 23 7.297	+ 0.0002	16 9 7.75	+ 0.020
B. D. + 17°, 750	6.2	4 28 9.900	+ 0.0025	+ 17 49 14.96	— 0.031
B. A. C. 1417	6.4	4 30 15.347	— 0.0028	19 41 25.18	+ 0.018
Mayer 177	6.1	4 40 50.933	+ 0.0053	18 34 1.20	— 0.067
B. D. + 19°, 811	6.2	4 49 30.388	+ 0.0078	19 20 6.46	— 0.048
B. D. + 21°, 755	6.3	4 58 49.080	+ 0.0028	21 8 52.24	— 0.034
Mayer 198	6.3	5 0 3.059	— 0.0036	+ 19 40 44.97	— 0.018
m Tauri	5.0	5 1 57.136	+ 0.0380	18 31 14.88	+ 0.026
l Tauri	5.2	5 2 18.132	— 0.0033	20 17 45.70	— 0.054
107 Tauri	6.5	5 3 21.039	+ 0.0002	19 44 22.69	— 0.015
B. A. C. 1639	6.2	5 13 44.552	— 0.0014	20 2 15.44	— 0.029
B. A. C. 1651	6.5	5 15 26.991	+ 0.0005	+ 19 43 14.65	— 0.024
o Tauri	4.8	5 22 2.907	+ 0.0006	21 51 28.90	— 0.010
Piazzi v, 125	6.1	5 28 7.111	— 0.0001	20 24 31.38	— 0.013
ζ Tauri	3.0	5 32 5.172	+ 0.0006	21 5 10.62	— 0.032
Piazzi v, 184	6.5	5 36 26.550	— 0.0020	22 36 52.13	+ 0.018
B. D. + 19°, 1110	6.0	5 46 52.798	— 0.0008	+ 19 50 39.51	— 0.031
χ <sup>1</sup> Orionis	4.5	5 48 52.528	— 0.0126	20 15 34.00	— 0.065
χ <sup>2</sup> Orionis	5.8	5 49 26.328	+ 0.0003	19 43 55.08	— 0.013
141 Tauri	6.3	5 56 4.644	— 0.0009	22 23 56.81	— 0.011
χ <sup>3</sup> Orionis	5.1	5 57 57.070	+ 0.0014	19 41 33.26	— 0.021
χ <sup>4</sup> Orionis	4.7	5 58 23.815	+ 0.0011	+ 20 8 28.15	— 0.003
1 Gemminorum	4.1	5 58 28.031	+ 0.0002	23 16 7.85	— 0.109
B. A. C. 1970	6.0	6 3 56.090	+ 0.0021	+ 22 12 19.31	— 0.040

MEAN PLACES FOR 1907.0 (January 0<sup>d</sup>.795, Washington.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion
		h m s	s	° ' "	"
3 Geminorum . . . . .	5.6	6 4 5.205	+ 0.0014	+ 23 7 45.15	+ 0.001
68 Orionis . . . . .	5.7	6 6 30.867	+ 0.0012	19 48 42.36	- 0.013
6 Geminorum . . . . .	6.3	6 6 40.861	+ 0.0007	22 55 48.09	- 0.013
B. A. C. 2064 . . . . .	6.0	6 19 53.809	- 0.0004	23 22 44.94	+ 0.015
15 Geminorum . . . . .	6.5	6 22 14.053	- 0.0015	20 50 48.92	- 0.054
16 Geminorum . . . . .	6.2	6 22 24.838	- 0.0019	+ 20 33 9.29	- 0.006
d Geminorum . . . . .	5.2	6 45 58.711	+ 0.0003	21 52 16.83	- 0.045
B. A. C. 2238 . . . . .	5.8	6 40 21.313	- 0.0006	23 42 43.67	- 0.021
44 Geminorum . . . . .	5.9	6 59 42.507	0.0000	22 46 38.01	- 0.020
Lalande 13849 . . . . .	6.5	7 4 35.731	- 0.0081	21 24 34.39	- 0.448
56 Geminorum . . . . .	5.2	7 16 27.642	- 0.0044	+ 20 37 11.01	- 0.025
58 Geminorum . . . . .	6.0	7 17 52.881	- 0.0022	23 7 28.92	- 0.054
B. A. C. 2455 . . . . .	6.4	7 21 20.568	- 0.0219	21 43 19.28	- 0.022
61 Geminorum . . . . .	5.8	7 21 27.488	- 0.0002	20 26 37.71	- 0.023
63 Geminorum . . . . .	5.3	7 22 13.237	- 0.0035	21 38 9.82	- 0.110
B. D. + 23°, 1744 . . . . .	6.4	7 27 16.302	- 0.0011	+ 23 5 10.74	- 0.007
B. D. + 23°, 1780 . . . . .	6.3	7 35 24.564	+ 0.0011	23 14 3.64	+ 0.007
B. A. C. 2544 . . . . .	6.3	7 37 49.954	- 0.0014	22 37 9.12	+ 0.026
79 Geminorum . . . . .	6.3	7 39 41.823	- 0.0013	20 32 23.28	- 0.012
82 Geminorum . . . . .	6.3	7 43 0.070	- 0.0010	23 22 17.76	- 0.001
B. A. C. 2605 . . . . .	6.2	7 46 32.322	- 0.0029	+ 19 33 49.23	- 0.030
85 Geminorum . . . . .	5.2	7 50 14.342	- 0.0011	20 7 47.84	- 0.043
B. D. + 20°, 1976 . . . . .	6.3	7 55 22.897	- 0.0018	20 4 17.84	- 0.007
B. F. 1128 . . . . .	6.1	7 59 22.867	- 0.0020	19 6 19.04	- 0.047
μ <sup>1</sup> Cancri . . . . .	6.2	8 0 47.783	- 0.0009	22 54 5.09	- 0.018
μ <sup>2</sup> Cancri . . . . .	5.5	8 2 17.602	+ 0.0019	+ 21 51 7.32	- 0.084
Piazzi viii, 42 . . . . .	6.0	8 14 55.664	+ 0.0052	21 2 29.11	- 0.063
d <sup>1</sup> Cancri . . . . .	5.7	8 18 2.421	- 0.0038	18 37 52.39	- 0.031
θ Cancri . . . . .	5.5	8 26 17.689	- 0.0039	18 24 32.52	- 0.068
39 Cancri . . . . .	6.5	8 34 45.560	- 0.0027	20 20 11.49	- 0.016
40 Cancri . . . . .	6.5	8 34 50.718	- 0.0014	+ 20 18 0.60	- 0.003
B. A. C. 2919 . . . . .	6.5	8 35 1.812	- 0.0048	19 59 57.23	- 0.011
ε Cancri . . . . .	6.3	8 35 7.140	- 0.0007	19 52 26.94	- 0.027
δ Cancri . . . . .	4.1	8 39 24.114	- 0.0008	18 29 47.51	- 0.240
B. A. C. 2991 . . . . .	6.1	8 45 27.603	- 0.0011	19 10 46.96	- 0.001
B. A. C. 3029 . . . . .	6.5	8 50 8.698	+ 0.0009	+ 17 35 8.30	+ 0.013
B. A. C. 3209 . . . . .	6.3	9 20 23.609	- 0.0042	16 59 14.02	- 0.014
8 Leonis . . . . .	5.9	9 31 54.842	- 0.0006	16 51 17.46	- 0.015
B. D. + 16°, 2077 . . . . .	6.3	10 0 38.332	- 0.0023	16 12 37.56	+ 0.017
34 Leonis . . . . .	6.4	10 6 38.271	+ 0.0037	13 48 52.35	- 0.035
37 Leonis . . . . .	5.5	10 11 41.317	- 0.0013	+ 14 11 32.55	- 0.014
42 Leonis . . . . .	6.1	10 16 50.354	- 0.0017	15 26 40.65	- 0.027
i Leonis . . . . .	5.8	10 27 14.011	- 0.0024	14 36 53.42	+ 0.022
Piazzi xi, 12 . . . . .	5.8	11 9 11.935	+ 0.0032	8 34 10.92	- 0.125
ω Virginis . . . . .	5.4	11 33 39.920	- 0.0005	8 38 56.42	- 0.012
ν Virginis . . . . .	4.2	11 41 4.790	- 0.0015	+ 7 3 2.18	- 0.186
b Virginis . . . . .	5.2	11 55 11.145	- 0.0008	4 10 23.70	- 0.012
B. D. + 6°, 2543 . . . . .	6.5	11 58 59.688	- 0.0095	6 4 40.21	- 0.076
c Virginis . . . . .	5.1	12 15 37.574	- 0.0198	3 49 49.64	- 0.072
Piazzi xii, 142 . . . . .	5.9	12 33 37.823	- 0.0042	+ 2 21 59.62	- 0.021
80 Virginis . . . . .	5.6	13 30 40.918	+ 0.0010	- 4 55 21.37	+ 0.075
Piazzi xiii, 174 . . . . .	6.4	13 39 3.787	- 0.0049	5 1 50.19	- 0.025
π Virginis . . . . .	6.5	13 43 25.965	- 0.0032	- 6 22 24.79	- 0.033

MEAN PLACES FOR 1907.0. (January 0 <sup>d</sup> .795, Washington.)					
Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ' "	"
Lalande 26147 . . . . .	6.5	14 13 4.211	+ 0.0116	— 7 6 22.90	— 0.232
ξ <sup>1</sup> Libræ . . . . .	5.7	14 49 19.790	— 0.0048	11 31 9.09	— 0.020
ξ <sup>2</sup> Libræ . . . . .	5.7	14 51 43.180	— 0.0006	11 2 4.90	— 0.001
17 Libræ . . . . .	6.4	14 53 10.910	— 0.0019	10 46 53.57	— 0.021
18 Libræ . . . . .	5.9	14 53 51.676	— 0.0079	10 46 14.30	— 0.077
Mayer 616 . . . . .	5.9	15 18 45.905	— 0.0043	— 12 2 16.35	— 0.038
γ Libræ . . . . .	4.1	15 30 19.336	+ 0.0047	14 28 46.75	+ 0.006
Bradley 1987 . . . . .	6.5	15 38 11.866	— 0.0009	14 44 43.16	— 0.115
η Libræ . . . . .	5.5	15 38 50.365	— 0.0028	15 22 37.05	— 0.079
W. B. xv, 839 . . . . .	6.2	15 46 26.671	— 0.0011	13 51 11.23	+ 0.001
θ Libræ . . . . .	4.4	15 48 31.692	+ 0.0066	— 16 27 24.56	+ 0.119
W. B. xv, 910 . . . . .	6.4	15 51 1.386	+ 0.0012	14 7 34.76	— 0.094
B. D. — 14°, 4314 . . . . .	6.2	15 51 19.299	+ 0.0047	14 33 26.87	— . . .
49 Libræ . . . . .	5.4	15 55 6.395	— 0.0435	16 15 34.92	— 0.390
B. D. — 17°, 4502 . . . . .	6.4	16 4 33.822	— 0.0056	18 5 37.18	— 0.007
B. A. C. 5408 . . . . .	6.4	16 9 17.084	— 0.0095	— 18 17 50.39	— 0.132
χ Ophiuchi . . . . .	4.9	16 21 37.937	— 0.0007	18 14 44.22	— 0.022
φ Ophiuchi . . . . .	4.4	16 25 48.848	— 0.0039	16 24 36.90	— 0.029
24 Scorpii . . . . .	5.0	16 36 11.556	— 0.0017	17 33 45.32	— 0.004
Bradley 2115 . . . . .	5.5	16 36 25.597	+ 0.0021	19 44 47.31	+ 0.045
Mayer 679 . . . . .	5.9	16 47 55.699	— 0.0032	— 20 15 37.42	— 0.040
B. A. C. 5700 . . . . .	6.1	16 51 36.037	— 0.0004	19 23 34.95	— 0.015
B. A. C. 5712 . . . . .	6.5	16 54 19.241	— 0.0047	18 6 15.10	— 0.156
29 Ophiuchi . . . . .	6.4	16 56 24.759	— 0.0024	18 44 56.77	— 0.020
B. A. C. 5746 . . . . .	6.2	16 59 14.710	+ 0.0002	20 21 51.04	— 0.013
Bradley 2162 . . . . .	6.3	17 0 38.537	— 0.0022	— 21 26 10.01	— 0.083
ξ Ophiuchi . . . . .	4.4	17 15 25.776	+ 0.0172	21 0 48.01	— 0.196
B. A. C. 5866 . . . . .	5.9	17 19 8.282	— 0.0008	21 21 19.28	— 0.045
Lalande 31611 . . . . .	6.3	17 19 10.327	+ 0.0016	18 21 34.64	+ 0.009
52 Ophiuchi . . . . .	6.4	17 29 42.772	— 0.0007	21 58 52.93	— 0.004
58 Ophiuchi . . . . .	4.8	17 37 51.421	— 0.0062	— 21 38 18.32	— 0.052
B. A. C. 6081 . . . . .	6.4	17 54 28.194	+ 0.0016	20 19 58.08	— 0.025
B. A. C. 6088 . . . . .	5.7	17 56 16.300	— . . . .	22 46 42.07	— . . .
B. A. C. 6125 . . . . .	6.2	18 1 36.713	+ 0.0006	21 27 13.46	— 0.003
Lalande 33327 . . . . .	6.3	18 5 44.019	— 0.0028	19 51 37.84	— 0.040
14 Sagittarii . . . . .	5.6	18 8 40.661	— 0.0012	— 21 44 18.10	— 0.023
15 Sagittarii . . . . .	5.3	18 9 40.024	+ 0.0003	20 45 22.43	+ 0.006
16 Sagittarii . . . . .	5.9	18 9 40.974	+ 0.0005	20 24 57.92	— 0.002
21 Sagittarii . . . . .	5.0	18 19 48.699	0.0000	20 35 30.66	— 0.024
Bradley 2332 . . . . .	5.7	18 32 20.288	— 0.0022	21 28 30.96	— 0.100
Bradley 2335 . . . . .	5.8	18 32 51.307	— 0.0015	— 23 35 4.85	— 0.020
B. A. C. 6347 . . . . .	5.9	18 33 20.721	— 0.0056	21 7 44.78	— 0.138
B. D. — 21°, 5131 . . . . .	6.3	18 39 45.596	+ 0.0019	21 5 47.20	— 0.040
28 Sagittarii . . . . .	5.6	18 40 44.140	+ 0.0018	22 29 23.52	+ 0.010
29 Sagittarii . . . . .	5.3	18 44 9.046	+ 0.0005	20 25 51.17	+ 0.030
30 Sagittarii . . . . .	6.2	18 45 15.031	— 0.0041	— 22 16 8.17	— 0.024
33 Sagittarii . . . . .	5.8	18 48 26.611	— 0.0008	21 28 26.61	— 0.015
ν <sup>1</sup> Sagittarii . . . . .	5.0	18 48 33.336	+ 0.0001	22 51 35.23	— 0.022
ν <sup>2</sup> Sagittarii . . . . .	5.1	18 49 29.839	+ 0.0069	22 47 16.40	— 0.024
Piazzi xviii, 225 . . . . .	5.9	18 50 22.829	— 0.0010	23 17 33.69	— 0.021
ξ <sup>1</sup> Sagittarii . . . . .	5.1	18 51 48.875	— 0.0010	— 20 46 42.22	— 0.011
ξ <sup>2</sup> Sagittarii . . . . .	3.7	18 52 10.920	+ 0.0023	21 13 45.74	— 0.023
B. A. C. 6485 . . . . .	6.3	18 56 1.413	+ 0.0005	— 22 49 36.30	+ 0.009



MEAN PLACES FOR 1907.0. (January 0<sup>d</sup>.795, Washington.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ' "	"
o Sagittarii . . . . .	3.9	18 59 6.622	+ 0.0050	— 21 52 41.51	— 0.064
Lalande 35745 . . . . .	6.5	19 3 7.373	— 0.0012	23 20 14.14	— 0.058
π Sagittarii . . . . .	3.0	19 4 14.022	— 0.0005	21 10 18.96	— 0.036
B. A. C. 6550 . . . . .	6.3	19 4 19.115	+ 0.0019	19 57 2.13	— 0.050
B. A. C. 6561 . . . . .	6.4	19 6 54.620	— 0.0003	21 48 47.30	— 0.040
Piazzi xix, 61 . . . . .	5.5	19 15 3.778	— 0.0016	— 22 34 33.51	+ 0.026
50 Sagittarii . . . . .	5.5	19 20 46.397	+ 0.0019	21 57 40.31	+ 0.001
B. A. C. 6671 . . . . .	6.1	19 25 22.928	+ 0.0026	21 30 21.68	— 0.028
53 Sagittarii . . . . .	6.3	19 34 14.224	— 0.0004	23 38 22.81	— 0.037
f Sagittarii . . . . .	5.1	19 40 56.278	— 0.0099	19 59 6.37	— 0.088
B. A. C. 6864 . . . . .	6.1	19 55 52.376	+ 0.0010	— 22 59 35.91	— 0.005
B. A. C. 6878 . . . . .	6.5	19 58 13.742	— 0.0019	22 51 24.09	+ 0.053
4 Capricorni . . . . .	5.7	20 12 33.618	+ 0.0012	22 5 51.42	— 0.032
o Capricorni . . . . .	5.5	20 14 1.739	— 0.0002	19 24 32.98	— 0.006
o Capricorni . . . . .	5.6	20 24 34.107	+ 0.0011	18 53 28.92	— 0.081
v Capricorni . . . . .	5.3	20 34 45.420	— 0.0018	— 18 27 58.88	— 0.007
B. D. — 18°, 5783 . . . . .	6.4	20 44 4.115	— 0.0004	18 22 45.31	— 0.019
19 Capricorni . . . . .	5.7	20 49 32.635	— 0.0041	18 16 33.19	— 0.013
20 Capricorni . . . . .	6.2	20 54 19.176	+ 0.0012	19 23 46.35	— 0.020
21 Capricorni . . . . .	6.5	20 55 37.827	— 0.0025	17 53 37.65	— 0.002
7 Capricorni . . . . .	4.8	20 59 6.841	— 0.0026	— 20 13 23.67	— 0.047
θ Capricorni . . . . .	4.1	21 0 43.244	+ 0.0050	17 36 10.25	— 0.066
B. D. — 17°, 6216 . . . . .	6.1	21 9 54.513	— 0.0011	17 43 47.74	— 0.002
30 Capricorni . . . . .	5.4	21 12 44.486	+ 0.0015	18 22 30.49	— 0.002
31 Capricorni . . . . .	6.3	21 13 3.559	+ 0.0031	17 51 9.78	+ 0.006
i Capricorni . . . . .	4.3	21 17 4.206	+ 0.0022	— 17 13 51.41	+ 0.004
γ Capricorni . . . . .	3.7	21 34 56.400	+ 0.0129	17 4 57.49	— 0.018
44 Capricorni . . . . .	6.0	21 38 0.047	— 0.0005	14 49 30.63	+ 0.024
45 Capricorni . . . . .	5.8	21 38 56.408	— 0.0013	15 10 33.31	— 0.002
δ Capricorni . . . . .	2.9	21 41 54.553	+ 0.0176	16 32 58.59	— 0.298
B. D. — 17°, 6389 . . . . .	6.5	21 45 6.104	— 0.0004	— 17 16 44.80	— 0.054
29 Aquarii . . . . .	6.5	21 57 21.238	+ 0.0008	17 24 46.42	+ 0.009
i Aquarii . . . . .	4.4	22 1 24.933	+ 0.0022	14 19 16.11	— 0.062
39 Aquarii . . . . .	6.2	22 7 24.938	+ 0.0016	14 39 7.40	— 0.044
42 Aquarii . . . . .	5.5	22 11 49.371	+ 0.0011	13 17 43.60	+ 0.009
45 Aquarii . . . . .	6.1	22 14 1.350	+ 0.0051	— 13 46 14.79	— 0.002
50 Aquarii . . . . .	5.9	22 19 28.258	+ 0.0034	14 0 3.48	+ 0.013
Bradley 2961 . . . . .	6.2	22 25 3.256	+ 0.0129	13 23 29.77	— 0.019
56 Aquarii . . . . .	6.1	22 25 18.406	+ 0.0022	15 3 40.62	— 0.034
70 Aquarii . . . . .	6.1	22 43 36.702	+ 0.0035	11 2 48.22	+ 0.010
74 Aquarii . . . . .	5.8	22 48 34.982	+ 0.0013	— 12 6 40.44	0.000
B. D. — 11°, 6032 . . . . .	6.3	23 9 49.437	— 0.0000	11 11 38.72	— 0.000
ψ <sup>1</sup> Aquarii . . . . .	4.5	23 11 1.214	+ 0.0250	9 35 39.88	— 0.005
χ Aquarii . . . . .	5.3	23 12 1.744	— 0.0015	8 14 1.72	— 0.014
ψ <sup>2</sup> Aquarii . . . . .	4.6	23 13 4.258	+ 0.0012	9 41 24.83	— 0.002
ψ <sup>3</sup> Aquarii . . . . .	5.2	23 14 7.481	+ 0.0027	— 10 7 9.63	— 0.001
B. D. — 10°, 6120 . . . . .	6.3	23 24 12.178	— 0.0000	9 46 39.67	— 0.000
B. A. C. 8214 . . . . .	6.5	23 30 44.250	— 0.0005	7 58 45.26	+ 0.018
Mayer 1012 . . . . .	6.3	23 43 45.792	+ 0.0009	6 53 48.84	— 0.023
27 Piscium . . . . .	5.1	23 53 54.719	— 0.0034	4 4 18.80	— 0.066
30 Piscium . . . . .	4.7	23 57 11.442	+ 0.0030	— 6 31 51.28	— 0.037

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.											
JANUARY.											
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
<i>d</i> <sup>1</sup> Cancrī	5.7	+0.28	-5.7	+18 37.8	1 1 48.9	-11 48.1	+1.1172	0.5498	-0.0751	+90	+45
<i>θ</i> Cancrī	5.5	0.26	5.6	18 24.4	5 42.0	-8 2.6	+1.0555	0.5492	0.0817	+90	+40
B. A. C. 2919	6.5	0.23	5.7	19 59.9	9 49.1	-4 3.5	-1.0388	0.5486	0.0887	-27	-70
<i>ε</i> Cancrī	6.3	0.23	5.7	19 52.4	9 51.6	-4 1.1	-0.9056	0.5487	0.0887	-16	-70
<i>δ</i> Cancrī	4.1	0.22	5.5	18 29.7	11 52.9	-2 3.8	+0.4209	0.5483	0.0921	+64	-1
B. A. C. 2991	6.1	+0.20	-5.5	+19 10.7	14 44.8	+0 42.5	-0.5974	0.5478	-0.0969	+3	-62
B. A. C. 3029	6.5	0.20	5.2	17 35.1	16 57.9	+2 51.3	+0.9275	0.5475	0.1004	+90	+28
B. A. C. 3209	6.3	0.10	4.7	16 59.2	2 7 21.5	-7 13.0	-0.0291	0.5446	0.1226	+35	-29
8 Leonis	5.9	+0.06	4.6	16 51.2	12 52.5	-1 52.6	-0.5834	0.5436	0.1306	+4	-65
34 Leonis	6.4	-0.06	3.3	13 48.8	3 5 37.3	-9 39.7	+0.3339	0.5403	0.1528	+57	-13
37 Leonis	5.5	-0.08	-3.3	+14 11.5	8 4.3	-7 17.4	-0.4521	0.5399	-0.1558	+12	-58
<i>l</i> Leonis	5.3	0.20	1.9	11 2.2	4 0 0.0	+8 8.2	+0.3173	0.5375	0.1733	+56	-16
Piazzi xi, 12	5.8	0.30	-0.6	8 34.2	12 9.8	-4 4.8	+0.7752	0.5364	0.1845	+90	+8
<i>ν</i> Virginis	4.2	0.44	+0.5	7 3.0	5 3 48.6	+11 4.7	-0.5923	0.5362	0.1960	+5	-74
<i>δ</i> Virginis	5.2	0.50	1.7	4 10.4	10 43.4	-6 13.5	+1.0792	0.5367	0.1999	+90	+27
B.D.+6°, 2543	6.5	-0.53	+1.1	+6 4.7	12 35.3	-4 25.0	-1.3030	0.5368	-0.2009	-50	-84
<i>c</i> Virginis	5.1	0.60	2.2	3 49.9	20 42.4	+3 26.8	-0.5813	0.5378	0.2044	+5	-75
Piazzi xii, 142	5.9	0.68	3.0	+2 22.0	6 5 27.0	+11 54.8	-0.8451	0.5396	0.2072	-10	-88
80 Virginis	5.6	0.96	6.3	-4 55.3	7 8 38.3	-9 46.5	+1.0468	0.5488	0.2074	+85	+24
Piazzi xiii, 174	6.4	1.00	6.4	5 1.7	12 32.8	-5 59.6	+0.3476	0.5507	0.2064	+56	-18
<i>n</i> Virginis	6.5	-1.02	+6.9	-6 22.3	14 34.3	-4 2.2	+1.3071	0.5518	-0.2058	+84	+51
Lalande 26147	6.5	1.18	7.3	7 6.3	8 4 7.1	+9 3.1	-0.6948	0.5590	0.1994	-3	-89
<i>ξ</i> <sup>1</sup> Libræ	5.7	1.38	8.7	11 31.0	20 11.0	+0 33.4	+0.6683	0.5695	0.1867	+77	-1
<i>ξ</i> <sup>2</sup> Libræ	5.7	1.39	8.5	11 1.9	21 13.4	+1 33.6	-0.0139	0.5702	0.1857	+33	-38
17 Libræ	6.4	1.40	8.4	10 46.8	21 51.4	+2 10.2	-0.3867	0.5706	0.1851	+12	-61
18 Libræ	5.9	-1.40	+8.4	-10 46.1	22 9.0	+2 27.2	-0.4520	0.5708	-0.1848	+9	-65
Mayer 616	5.9	1.53	8.5	12 2.1	9 8 47.9	-11 17.1	-1.0795	0.5784	0.1727	-32	-90
<i>γ</i> Libræ	4.1	1.60	9.1	14 28.6	13 38.8	-6 37.0	+0.5441	0.5819	0.1663	+65	-7
Bradley 1987	6.5	1.64	9.1	14 44.6	16 55.1	-3 28.0	+0.2724	0.5843	0.1617	+46	-22
<i>η</i> Libræ	5.5	1.64	9.3	15 22.5	17 11.0	-3 12.7	+0.8603	0.5845	0.1613	+75	+12
W. B. xv, 839	6.2	-1.67	+8.6	-13 51.0	20 19.0	-0 11.7	-1.1581	0.5868	-0.1566	-42	-90
<i>θ</i> Libræ	4.4	1.70	9.2	16 27.3	21 10.2	+0 37.5	+1.3045	0.5874	0.1553	+74	+60
W. B. xv, 910	6.4	1.69	8.6	14 7.4	22 11.4	+1 36.3	-1.1758	0.5882	0.1537	-44	-90
B. D.-14°, 4314	6.2	1.70	8.7	14 33.3	22 18.8	+1 43.5	-0.7649	0.5882	0.1535	-13	-90
49 Libræ	5.4	1.73	9.0	16 15.4	23 51.3	+3 12.4	+0.6957	0.5894	0.1510	+73	+2
<i>χ</i> Ophiuchi	4.9	-1.86	+8.8	-18 14.6	10 10 30.8	-10 32.8	+1.1521	0.5970	-0.1324	+72	+36
VENUS	.	.	.	17 0.1	12 3.6	-9 3.6	-0.2830	0.5742	0.1261	+12	-54
<i>φ</i> Ophiuchi	4.4	1.86	8.2	16 24.5	12 10.2	-8 57.3	-0.8842	0.5981	0.1293	-23	-90
24 Scorpii	5.0	1.91	8.2	17 33.6	16 15.4	-5 1.9	-0.2544	0.6008	0.1213	+12	-52
B. A. C. 5700	6.1	1.99	8.0	19 23.4	22 15.6	+0 43.9	+0.8631	0.6046	0.1090	+71	+14
B. A. C. 5712	6.5	-1.99	+7.6	-18 6.1	23 18.8	+1 44.7	-0.5233	0.6052	-0.1067	-4	-73
29 Ophiuchi	6.4	2.00	7.7	18 44.8	11 0 7.3	+2 31.1	+0.0280	0.6056	0.1050	+26	-35
Lalande 31611	6.3	2.08	+6.8	18 21.5	8 50.3	+10 52.8	-1.1858	0.6104	-0.0854	-52	-90
NEW MOON.											
45 Capricorni	5.8	-2.00	-6.8	-15 10.7	15 11 54.3	+9 53.3	-0.7446	0.5860	+0.1458	-13	-90
<i>δ</i> Capricorni	2.9	2.02	7.1	16 33.1	13 7.9	+11 4.2	+0.8179	0.5851	0.1478	+73	+10
<i>ε</i> Aquarii	4.4	1.91	7.6	14 19.4	21 17.7	-5 4.2	-0.1719	0.5785	0.1599	+21	-47
39 Aquarii	6.2	1.90	8.0	14 39.3	23 50.6	-2 36.9	+0.5753	0.5765	0.1633	+67	-5
42 Aquarii	5.5	1.86	7.9	13 17.9	16 1 43.6	-0 48.0	-0.4900	0.5749	0.1657	+5	-69
45 Aquarii	6.1	-1.86	-8.1	-13 46.4	2 40.2	+0 6.5	+0.1491	0.5742	+0.1670	+39	-29
50 Aquarii	5.9	1.84	8.4	14 0.2	5 1.1	+2 22.4	+0.7792	0.5723	0.1699	+76	+7
Bradley 2961	6.2	1.81	8.5	13 23.6	7 26.3	+4 42.4	+0.5751	0.5704	0.1727	+68	-5
70 Aquarii	6.1	1.71	8.8	11 3.0	15 36.1	-11 25.1	-0.3719	0.5640	0.1813	+13	-61
74 Aquarii	5.8	1.70	9.3	12 6.8	17 49.2	-9 16.6	+1.1233	0.5622	0.1833	+78	+31
<i>ψ</i> Aquarii	4.5	-1.56	-9.5	-9 35.8	17 3 59.5	+0 33.0	+0.4482	0.5547	+0.1915	+62	-13

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## JANUARY.

THE STAR'S				AT CONJUNCTION IN R. A.								Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		s	"	°	d	h	m			°	°		
$\chi$ Aquarii	5.3	-1.55	-9.2	- 8 14.2	17	4	27.3	+ 0 59.9	-0.8676	0.5544	+0.1918	-14	-90
$\psi$ Aquarii	4.6	1.56	9.6	9 41.6	4	56.0	+ 1 27.6	+0.7283	0.5540	0.1921	+80	+ 3	
$\psi$ Aquarii	5.2	1.56	9.8	10 7.3	5	25.2	+ 1 55.9	+1.2653	0.5537	0.1924	+80	+46	
B. A. C. 8214	6.5	1.46	9.8	7 58.9	13	8.8	+ 9 24.2	+0.5588	0.5484	0.1969	+71	- 6	
Mayer 1012	6.3	1.38	9.8	6 54.0	19	18.3	- 8 38.3	+0.6567	0.5445	0.1997	+80	- 1	
27 Piscium	5.1	-1.31	-9.3	- 4 4.5	18	0	9.7	- 3 56.4	-1.3214	0.5416	+0.2014	-54	-90
B. A. C. 81	6.3	1.17	9.5	2 44.2	12	44.2	+ 8 14.4	-0.1826	0.5350	0.2039	+27	-48	
14 Ceti	5.4	1.10	9.2	- 1 1.1	18	11.7	-10 28.3	-0.8859	0.5325	0.2041	-13	-90	
26 Ceti	6.0	0.95	9.2	+ 0 52.0	19	8	22.7	+ 3 16.9	-0.0049	0.5272	0.2028	+37	-37
33 Ceti	6.1	0.90	8.9	1 56.9	11	48.1	+ 6 36.0	-0.4702	0.5262	0.2020	+12	-66	
$\gamma$ Piscium	5.1	-0.86	-8.7	+ 3 7.3	15	29.0	+10 10.3	-0.9877	0.5252	+0.2011	-19	-87	
Lalande 2632	6.5	0.81	8.8	3 3.0	20	7.7	- 9 19.3	+0.0185	0.5241	0.1995	+38	-36	
$\nu$ Piscium	4.6	0.73	8.4	5 0.9	20	34.8	- 2 5.5	-0.6234	0.5228	0.1966	+ 3	-78	
Piazzi i, 249	6.5	0.60	7.9	7 17.3	15	38.4	+ 9 36.7	-0.7553	0.5215	0.1903	- 5	-79	
64 Ceti	5.8	0.57	7.7	8 8.0	19	0.1	-11 7.5	-1.0393	0.5213	0.1882	-24	-82	
$\xi$ Ceti	4.5	-0.56	-7.6	+ 8 24.5	19	50.7	-10 18.4	-1.1816	0.5213	+0.1876	-36	-82	
25 Arietis	6.5	0.48	7.3	9 47.0	21	3	17.3	- 3 5.0	-1.3068	0.5213	0.1825	-53	-80
$\xi$ Ceti	4.5	0.48	7.9	8 2.5	3	41.2	- 2 41.8	+0.6689	0.5213	0.1823	+85	+ 2	
B. F. 310	6.3	0.47	7.5	9 8.9	4	25.0	- 1 59.3	-0.4078	0.5213	0.1817	+15	-59	
85 Ceti	6.3	0.40	7.2	10 20.6	11	4.1	+ 4 28.0	-0.5245	0.5217	0.1766	+ 9	-67	
$\mu$ Ceti	4.3	-0.39	-7.4	+ 9 43.2	12	19.8	+ 5 41.5	+0.3810	0.5218	+0.1755	+60	-13	
W. B. ii, 1033	5.8	0.27	6.6	12 49.7	23	21.4	- 7 36.4	-1.1496	0.5231	0.1657	-33	-77	
B.D.+12°, 473	6.2	0.18	6.9	12 17.9	22	8	28.3	+ 1 14.2	+0.9029	0.5247	0.1566	+90	+19
$\gamma$ Tauri	4.3	0.15	6.9	12 37.0	11	53.3	+ 4 33.1	+1.0817	0.5254	0.1530	+90	+33	
Mayer 121	6.4	-0.11	6.1	15 7.4	15	22.5	+ 7 56.0	-1.1602	0.5262	0.1491	-36	-75	
B. D.+14°, 657	5.9	+0.02	-6.4	+14 54.7	22	6	28.5	- 1 25.3	+1.1920	0.5301	+0.1310	+90	+46
Piazzi iii, 249	6.1	0.03	5.8	17 5.4	6	35.4	- 1 18.7	-1.2048	0.5301	0.1309	-42	-73	
B. D.+16°, 569	6.2	0.05	5.8	17 2.2	8	51.5	+ 0 53.3	-0.8528	0.5307	0.1279	-12	-73	
$\delta$ Tauri	3.9	0.10	5.8	17 19.4	14	2.8	+ 5 55.0	-0.5242	0.5323	0.1211	+ 8	-59	
63 Tauri	5.7	0.10	6.0	16 33.5	14	18.1	+ 6 9.8	+0.3539	0.5323	0.1207	+59	- 9	
$\delta$ Tauri	4.9	+0.10	-5.9	+17 13.6	14	37.6	+ 6 28.8	-0.3480	0.5324	+0.1203	+18	-47	
$\delta$ Tauri	4.3	0.11	5.7	17 42.8	15	18.7	+ 7 8.6	-0.8056	0.5326	0.1193	- 9	-72	
75 Tauri	5.2	0.12	6.2	16 9.0	16	48.6	+ 8 35.8	+1.1056	0.5331	0.1173	+90	+39	
B.D.+17°, 750	6.2	0.14	5.8	17 49.2	19	18.8	+11 1.3	-0.4558	0.5338	0.1138	+13	-54	
Mayer 177	6.1	0.20	5.6	18 33.9	24	1	34.8	- 6 54.4	-0.5937	0.5357	0.1048	+ 3	-63
$\iota$ Tauri	5.2	+0.22	-5.6	+18 40.8	4	4.8	- 4 28.9	-0.4690	0.5365	+0.1011	+11	-54	
B. D.+19°, 811	6.2	0.23	5.5	19 20.0	5	50.0	- 2 47.0	-1.0189	0.5370	0.0985	-25	-71	
Mayer 198	6.3	0.27	5.5	19 40.7	10	59.3	+ 2 12.5	-0.9132	0.5386	0.0906	-17	-70	
$m$ Tauri	5.0	0.28	5.8	18 31.2	11	54.8	+ 3 6.2	+0.4558	0.5389	0.0892	+67	+ 1	
107 Tauri	6.5	0.29	5.5	19 44.3	12	35.7	+ 3 45.9	-0.8367	0.5392	0.0881	-12	-70	
B. A. C. 1639	6.2	+0.33	-5.5	+20 2.2	17	38.4	+ 8 39.1	-0.7430	0.5407	+0.0801	- 6	-70	
B. A. C. 1651	6.5	0.33	5.6	19 43.2	18	28.0	+ 9 27.0	-0.3256	0.5409	0.0788	+19	-41	
Piazzi v, 125	6.1	0.38	5.5	20 24.4	25	0	34.6	- 8 38.0	-0.6380	0.5427	0.0688	0	-63
$\zeta$ Tauri	3.0	0.39	5.4	21 5.1	2	28.9	- 6 47.4	-1.2617	0.5433	0.0656	-57	-69	
B.D.+19°, 1110	6.0	0.43	5.8	19 50.6	9	33.5	+ 0 3.6	+0.5382	0.5452	0.0536	+75	+ 9	
$\chi^1$ Orionis	4.5	+0.44	-5.8	+20 15.5	10	30.6	+ 0 58.8	+0.1279	0.5455	+0.0519	+44	-13	
$\chi^2$ Orionis	5.8	0.44	5.9	19 43.8	10	46.7	+ 1 14.5	+0.7267	0.5456	0.0515	+90	+20	
$\chi^3$ Orionis	5.1	0.46	5.9	19 41.5	14	49.5	+ 5 9.4	+0.9641	0.5466	0.0443	+90	+36	
$\chi^4$ Orionis	4.7	0.47	5.9	20 8.4	15	2.2	+ 5 21.7	+0.4762	0.5466	0.0440	+69	+ 7	
68 Orionis	5.7	0.50	6.0	19 48.6	18	53.0	+ 9 5.0	+0.9972	0.5476	0.0372	+90	+39	
15 Geminorum	6.5	+0.53	-5.9	+20 50.7	26	2	18.1	- 7 44.3	+0.0773	0.5492	+0.0239	+42	-13
16 Geminorum	6.2	0.53	6.0	20 33.1	2	23.2	- 7 39.4	+0.4052	0.5492	0.0237	+63	+ 5	
$\nu$ Geminorum	4.2	0.53	6.0	20 16.2	2	52.2	- 7 11.4	+0.7274	0.5494	0.0229	+90	+23	
NEPTUNE	..	..	..	22 7.9	13	19.6	+ 2 55.5	-1.1919	0.5524	0.0036	-45	-68	
$\mu$ Geminorum	5.2	0.59	5.9	21 52.2	13	26.4	+ 3 2.0	-0.9019	0.5512	+0.0035	-17	-68	
$\zeta$ Geminorum	4.0	+0.61	-6.2	+20 42.3	19	20.0	+ 8 44.0	+0.3724	0.5519	-0.0074	+61	+ 5	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.											
JANUARY.											
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		$\alpha$	$\delta$	$\circ$	<i>d h m</i>	<i>h m</i>				$\circ$	$\circ$
Lalande 13849	6.5	+0.62	-6.2	+21 24.5	26 22 7.9	+11 26.3	-0.4305	0.5522	-0.0126	+12	-42
56 Geminorum	5.2	0.64	6.3	20 37.1	27 3 39.5	- 7 13.1	+0.3422	0.5527	0.0229	+59	+ 2
B. A. C. 2455	6.4	0.64	6.2	21 43.2	5 55.8	- 5 1.3	-0.9286	0.5529	0.0271	-20	-68
61 Geminorum	5.8	0.64	6.3	20 26.5	5 59.0	- 4 58.2	+0.4775	0.5529	0.0272	+69	+ 9
63 Geminorum	5.3	0.64	6.2	21 38.1	6 20.3	- 4 37.5	-0.8451	0.5529	0.0279	-13	-68
79 Geminorum	6.3	+0.66	-6.4	+20 32.3	14 27.9	+ 3 13.7	+0.0741	0.5532	-0.0429	+41	-15
B. A. C. 2605	6.2	0.66	6.5	19 33.7	17 38.7	+ 6 18.4	+1.0003	0.5532	0.0487	+90	+39
85 Geminorum	5.2	0.67	6.5	20 7.7	19 21.9	+ 7 58.1	+0.2918	0.5532	0.0519	+55	- 4
B. D. +20°, 1976	6.3	0.67	6.5	20 4.2	21 45.4	+10 16.8	+0.2264	0.5532	0.0562	+51	- 8
B. F. 1128	6.1	0.67	6.6	19 6.2	23 37.0	-11 55.2	+1.1782	0.5532	0.0596	+90	+53
$\alpha$ Cancri	5.7	+0.68	-6.6	+18 37.8	28 8 18.2	- 3 31.3	+1.1092	0.5527	-0.0751	+90	+45
$\theta$ Cancri	5.5	0.68	6.6	18 24.4	12 9.1	+ 0 12.0	+1.0490	0.5523	0.0818	+90	+39
B. A. C. 2919	6.5	0.68	6.6	19 59.8	16 13.9	+ 4 8.7	-1.0359	0.5520	0.0889	-27	-70
$\varepsilon$ Cancri	6.3	0.68	6.6	19 52.3	16 16.4	+ 4 11.2	-0.9030	0.5520	0.0890	-16	-70
$\delta$ Cancri	4.1	0.68	6.7	18 29.7	18 16.5	+ 6 7.3	+0.4188	0.5518	0.0924	+65	- 1
B. A. C. 2991	6.1	+0.68	-6.7	+19 10.7	21 6.6	+ 8 51.8	-0.5947	0.5514	-0.0971	+ 3	-62
B. A. C. 3029	6.5	0.67	6.7	17 35.0	23 18.3	+10 59.1	+0.9249	0.5511	0.1008	+90	+28
B. A. C. 3209	6.3	0.65	6.5	16 59.1	29 13 32.2	+ 0 45.2	-0.0243	0.5489	0.1233	+36	-29
8 Leonis	5.9	0.63	6.5	16 51.2	18 59.4	+ 6 1.8	-0.5750	0.5480	0.1315	+ 5	-64
34 Leonis	6.4	0.58	6.1	13 48.8	30 11 32.2	- 1 57.4	+0.3417	0.5448	0.1540	+58	-12
37 Leonis	5.5	+0.56	-6.1	+14 11.4	13 57.5	+ 0 23.2	-0.4413	0.5444	-0.1576	+13	-57
7 Leonis	5.2	0.49	5.4	11 2.2	31 5 42.8	- 8 21.6	+0.3274	0.5416	0.1746	+57	-15
Piazz xi, 12	5.8	0.43	4.7	8 34.1	17 46.1	+ 3 18.9	+0.7856	0.5399	0.1857	+90	+ 9
FEBRUARY.											
$\nu$ Virginis	4.2	+0.33	-3.9	+ 7 3.0	1 9 19.1	- 5 37.5	-0.5812	0.5387	-0.1969	+ 5	-73
$\delta$ Virginis	5.2	0.29	3.0	4 10.3	16 12.6	+ 1 3.1	+1.0917	0.5385	0.2007	+90	+28
B. D. +6°, 2543	6.5	0.26	3.4	6 4.6	18 4.2	+ 2 51.2	-1.2941	0.5385	0.2016	-48	-84
$\epsilon$ Virginis	5.1	0.20	2.6	3 49.8	2 11.3	+10 43.1	-0.5726	0.5387	0.2048	+ 6	-74
Piazz xii, 142	5.9	+0.14	-2.0	+ 2 22.0	10 57.3	- 4 47.5	-0.8391	0.5394	-0.2072	-10	-88
80 Virginis	5.6	-0.10	+1.1	- 4 55.3	3 14 24.2	- 2 13.2	+1.0614	0.5452	0.2063	+85	+25
Piazz xiii, 174	6.4	0.14	1.2	5 1.8	18 22.3	+ 1 37.1	+0.3558	0.5466	0.2051	+58	-18
$\eta$ Virginis	6.5	0.16	1.8	6 22.4	20 26.0	+ 3 36.9	+1.3242	0.5473	0.2043	+84	+54
Lalande 26147	6.5	0.31	2.3	7 6.3	4 10 15.2	- 7 1.4	-0.7005	0.5529	0.1973	- 3	-90
$\xi^1$ Libræ	5.7	-0.50	+4.0	-11 31.1	5 2 44.1	+ 8 54.0	+0.6774	0.5612	-0.1842	+77	0
$\xi^2$ Libræ	5.7	0.51	3.9	11 2.0	3 48.2	+ 9 55.9	-0.0146	0.5619	0.1832	+32	-38
17 Libræ	6.4	0.52	3.8	10 46.8	4 27.4	+10 33.7	-0.3927	0.5622	0.1825	+12	-61
18 Libræ	5.9	0.53	3.8	10 46.2	4 45.5	+10 51.2	-0.4590	0.5623	0.1822	+ 8	-66
Mayer 616	5.9	0.66	4.2	12 2.2	15 44.2	- 2 33.2	-1.0984	0.5688	0.1700	-34	-90
$\gamma$ Libræ	4.1	-0.72	+5.1	-14 28.7	20 44.7	+ 2 16.6	+0.5498	0.5719	-0.1636	+65	- 7
Bradley 1987	6.5	0.77	5.1	14 44.6	6 0 7.7	+ 5 32.2	+0.2735	0.5740	0.1590	+45	-22
$\eta$ Libræ	5.5	0.77	5.3	15 22.5	0 24.2	+ 5 48.2	+0.8708	0.5741	0.1586	+75	+13
W. B. xv, 839	6.2	0.81	4.8	13 51.1	3 38.7	+ 8 55.6	-1.1810	0.5762	0.1539	-44	-90
W. B. xv, 910	6.4	0.84	4.8	14 7.5	5 35.2	+10 47.8	-1.1992	0.5774	0.1510	-46	-90
B. D. -14°, 4314	6.2	-0.84	+5.0	-14 33.4	5 42.7	+10 55.0	-0.7815	0.5775	-0.1508	-14	-90
49 Libræ	5.4	0.87	5.5	16 15.5	7 18.6	-11 32.6	+0.7031	0.5785	0.1483	+73	+ 2
$\chi$ Ophiuchi	4.9	1.02	5.9	18 14.6	18 21.4	- 0 54.5	+1.1667	0.5854	0.1299	+72	+38
$\phi$ Ophiuchi	4.4	1.04	5.2	16 24.5	20 4.6	+ 0 44.8	-0.9046	0.5865	0.1269	-24	-90
24 Scorpii	5.0	1.10	5.4	17 33.7	7 0 18.9	+ 4 49.5	-0.2644	0.5891	0.1190	+11	-53
B. A. C. 5700	6.1	-1.19	+5.7	-19 23.5	6 32.7	+10 48.9	+0.8722	0.5927	-0.1069	+71	+14
B. A. C. 5712	6.5	1.20	5.2	18 6.2	7 38.2	+11 52.0	-0.5384	0.5933	0.1047	- 5	-74
29 Ophiuchi	6.4	1.21	5.4	18 44.9	8 28.5	-11 19.8	+0.0224	0.5938	0.1030	+25	-36
Lalande 31611	6.3	1.32	4.7	18 21.5	17 31.0	- 2 38.6	-1.2122	0.5986	0.0838	-55	-90
B. A. C. 6081	6.4	1.50	4.2	20 19.9	8 7 17.9	+10 35.3	-0.1759	0.6045	0.0522	+10	-48
B. A. C. 6125	6.2	-1.55	+4.2	-21 27.2	10 3.5	-10 45.8	+0.8086	0.6055	-0.0456	+69	+10

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		s	"	°	d h m	h m				°	°		
Lalande 33327	6.3	-1.55	+ 3.6	-19 51.6	8 11 38.8	- 9 14.4	-0.8518	0.6059	-0.0418	-29	-90		
$\mu$ Sagittarii	4.1	1.57	3.9	21 5.0	12 35.8	- 8 19.7	+0.3308	0.6062	0.0395	+37	-18		
14 Sagittarii	5.6	1.58	4.0	21 44.2	12 46.8	- 8 9.2	+0.9771	0.6063	0.0391	+68	+22		
15 Sagittarii	5.3	1.57	3.8	20 45.3	13 9.7	- 7 47.1	-0.0179	0.6064	0.0381	+19	-38		
16 Sagittarii	5.9	1.57	3.7	20 24.9	13 10.0	- 7 46.9	-0.3577	0.6064	0.0381	- 1	-60		
VENUS				-19 56.4	13 42.2	- 7 15.9	-0.8555	0.5669	-0.0348	-30	-90		
21 Sagittarii	5.0	-1.61	+ 3.3	20 35.5	17 3.5	- 4 2.9	-0.3119	0.6074	0.0286	0	-56		
Bradley 2332	5.7	1.67	3.0	21 28.5	21 51.3	+ 0 33.2	+0.4606	0.6084	0.0167	+44	-11		
B. A. C. 6347	5.9	1.67	2.9	21 7.7	22 14.4	+ 0 55.4	+0.1092	0.6085	0.0158	+22	-31		
B.D. -21°, 5131	6.3	1.69	2.6	21 5.7	9 0 41.6	+ 3 16.6	+0.0455	0.6088	0.0097	+18	-34		
29 Sagittarii	5.3	-1.70	+ 2.3	-20 25.8	2 22.2	+ 4 53.1	-0.6306	0.6091	-0.0055	-20	-85		
30 Sagittarii	6.2	1.73	2.7	22 16.1	2 47.4	+ 5 17.3	+1.1994	0.6091	0.0044	+68	+46		
33 Sagittarii	5.8	1.73	2.4	21 28.4	4 0.5	+ 6 27.4	+0.4036	0.6092	-0.0013	+39	-14		
$\xi$ Sagittarii	5.1	1.73	2.1	20 46.7	5 17.6	+ 7 41.3	-0.2893	0.6094	+0.0019	- 1	-55		
$\zeta$ Sagittarii	3.7	1.73	2.1	21 13.7	5 26.1	+ 7 49.4	+0.1604	0.6094	0.0022	+25	-28		
$\theta$ Sagittarii	3.9	-1.77	+ 2.0	-21 52.7	8 4.6	+10 21.4	+0.8217	0.6095	+0.0089	+68	+12		
$\pi$ Sagittarii	3.0	1.78	1.6	21 10.3	10 1.9	-11 46.1	+0.1400	0.6095	0.0138	+24	-29		
B. A. C. 6550	6.3	1.76	1.3	19 57.0	10 3.8	-11 44.2	-1.0765	0.6095	0.0138	-48	-90		
B. A. C. 6561	6.4	1.80	1.6	21 48.8	11 3.2	-10 47.3	+0.7943	0.6095	0.0163	+68	+10		
50 Sagittarii	5.5	1.84	1.0	21 57.7	16 20.6	- 5 42.8	+1.0632	0.6092	0.0295	+68	+30		
B. A. C. 6671	6.1	-1.85	+ 0.7	-21 30.4	18 6.3	- 4 1.5	+0.6656	0.6090	+0.0339	+63	+ 1		
f Sagittarii	5.1	1.86	- 0.4	19 59.1	10 0 3.6	+ 1 41.2	-0.6043	0.6081	0.0485	-14	-82		
NEW MOON.													
Mayer 1012	6.3	1.57	10.5	6 54.0	14 5 30.2	+ 3 21.7	+0.6875	0.5513	0.2027	+83	+ 1		
27 Piscium	5.1	-1.51	-10.3	- 4 4.5	10 15.6	+ 7 57.7	-1.2726	0.5487	+0.2045	-46	-90		
B. A. C. 81	6.3	1.43	10.6	2 44.2	22 33.5	- 4 8.2	-0.1373	0.5425	0.2072	+29	-90		
14 Ceti	5.4	1.38	10.5	- 1 1.2	15 3 53.4	+ 1 1.5	-0.8312	0.5401	0.2075	- 9	-45		
26 Ceti	6.0	1.26	10.5	+ 0 51.9	17 44.3	- 9 33.6	+0.0476	0.5348	0.2061	+40	-34		
33 Ceti	6.1	1.23	10.3	1 56.9	21 4.7	- 6 19.4	-0.4115	0.5336	0.2053	+15	-62		
f Piscium	5.1	-1.20	-10.1	+ 3 7.3	16 0 40.4	- 2 50.3	-0.9223	0.5326	+0.2043	-15	-87		
Lalande 2632	6.5	1.16	10.2	3 3.0	5 12.5	+ 1 33.5	+0.0757	0.5314	0.2026	+41	-32		
v Piscium	4.6	1.09	9.9	5 0.9	12 29.2	+ 8 36.9	-0.5571	0.5297	0.1995	+ 7	-72		
Piazzii, 249	6.5	0.98	9.4	7 17.2	17 0 16.6	- 3 57.2	-0.6839	0.5278	0.1929	0	-82		
64 Ceti	5.8	0.95	9.1	8 7.9	3 34.0	- 0 45.7	-0.9642	0.5274	0.1907	-18	-82		
$\xi$ Ceti	4.5	-0.94	- 9.1	+ 8 24.5	4 23.6	+ 0 2.3	-1.1049	0.5273	+0.1901	-29	-82		
25 Arietis	6.5	0.88	8.8	9 47.0	11 41.2	+ 7 6.8	-1.2274	0.5268	0.1847	-41	-80		
$\xi$ Ceti	4.5	0.87	9.3	8 2.5	12 4.7	+ 7 29.6	+0.7307	0.5268	0.1844	+85	+ 5		
B. F. 310	6.3	0.87	8.9	9 8.9	12 47.6	+ 8 11.2	-0.3363	0.5267	0.1839	+19	-54		
85 Ceti	6.3	0.80	8.6	10 20.6	19 19.2	- 9 29.0	-0.4505	0.5266	0.1785	+13	-62		
$\mu$ Ceti	4.3	-0.80	- 8.8	+ 9 43.2	20 33.6	- 8 16.8	+0.4476	0.5266	+0.1774	+65	-10		
W. B. ii, 1033	5.8	0.69	7.8	12 49.6	18 7 24.3	+ 2 14.2	-1.0690	0.5271	0.1672	-27	-77		
B. D. +12°, 473	6.2	0.60	8.1	12 17.9	16 23.5	+10 57.2	+0.9700	0.5279	0.1577	+90	+24		
f Tauri	4.3	0.56	8.0	12 37.0	19 46.0	- 9 46.5	+1.1481	0.5283	0.1539	+90	+39		
Mayer 121	6.4	0.53	7.1	15 7.4	23 12.6	- 6 26.2	-1.0789	0.5288	0.1500	-28	-75		
B. D. +14°, 657	5.9	-0.38	- 7.2	+14 54.7	19 14 10.1	+ 8 4.0	+1.2606	0.5314	+0.1314	+90	+54		
Piazzii iii, 249	6.1	0.38	6.4	17 5.4	14 16.9	+ 8 10.5	-1.1245	0.5314	0.1312	-33	-73		
B. D. +16°, 569	6.2	0.36	6.4	17 2.2	16 32.0	+10 21.5	-0.7745	0.5318	0.1282	- 7	-73		
$\delta$ Tauri	3.9	0.31	6.4	17 19.4	21 41.3	- 8 38.7	-0.4478	0.5329	0.1212	+12	-54		
63 Tauri	5.7	0.30	6.6	16 33.5	21 56.5	- 8 24.0	+0.4265	0.5330	0.1209	+65	- 4		
$\theta$ Tauri	4.9	-0.30	- 6.4	+17 13.6	22 15.9	- 8 5.1	-0.2724	0.5330	+0.1204	+22	-43		
$\delta$ Tauri	4.3	0.29	6.2	17 42.8	22 56.7	- 7 25.6	-0.7281	0.5332	0.1194	- 4	-73		
75 Tauri	5.2	0.28	6.8	16 9.0	20 26.2	- 5 58.9	+1.1751	0.5335	0.1174	+90	+46		
B. D. +17°, 750	6.2	0.25	6.2	17 49.1	2 55.6	- 3 34.2	-0.3803	0.5341	0.1138	+16	-49		
Mayer 177	6.1	0.19	6.0	18 33.9	9 10.1	+ 2 28.7	-0.5235	0.5356	0.1047	+ 8	-58		
i Tauri	5.2	-0.16	- 5.9	+18 40.8	11 39.6	+ 4 53.5	-0.3948	0.5361	0.1010	+15	-48		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.											
FEBRUARY.											
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		$\alpha$	$\delta$	$\alpha$	d h m	h m				$\alpha$	$\delta$
B.D. +19° 811	6.2	-0.14	-5.7	+19 20.0	20 13 24.5	+ 6 35.1	-0.9432	0.5366	+0.0983	-19	-71
Mayer 198	6.3	0.09	5.6	19 40.7	18 33.1	+11 34.0	-0.8391	0.5378	0.0903	-12	-70
<i>m</i> Tauri	5.0	0.08	6.0	18 31.1	19 28.6	-11 32.3	+0.5261	0.5380	0.0889	+73	+ 5
107 Tauri	6.5	0.08	5.6	19 44.3	20 9.4	-10 52.7	-0.7632	0.5382	0.0878	- 7	-70
B. A. C. 1639	6.2	0.03	5.4	20 2.2	21 1 11.8	- 5 59.8	-0.6710	0.5395	0.0798	- 1	-67
B. A. C. 1651	6.5	-0.02	-5.6	+19 43.2	2 1.4	- 5 11.8	-0.2547	0.5397	+0.0784	+23	-37
Piazz v. 125	6.1	+0.04	5.4	20 24.4	8 8.0	+ 0 43.1	-0.5682	0.5412	0.0683	+ 5	-57
$\zeta$ Tauri	3.0	0.06	5.2	21 5.1	10 2.4	+ 2 33.8	-1.1913	0.5417	0.0652	-44	-69
B.D. +19° 1110	6.0	0.13	5.6	19 50.6	17 7.4	+ 9 25.2	+0.6032	0.5433	0.0531	+81	+12
$\chi^1$ Orionis	4.5	0.14	5.5	20 15.5	18 4.6	+10 20.6	+0.1933	0.5436	0.0515	+49	-10
$\chi^2$ Orionis	5.8	+0.14	-5.6	+19 43.8	18 20.7	+10 36.2	+0.7911	0.5437	+0.0510	+90	+24
$\chi^3$ Orionis	5.1	0.18	5.7	19 41.5	22 24.0	- 9 28.4	+1.0270	0.5447	0.0439	+90	+41
$\chi^4$ Orionis	4.7	0.19	5.5	20 8.4	22 36.7	- 9 16.1	+0.5396	0.5446	0.0436	+75	+10
68 Orionis	5.7	0.22	5.6	19 48.6	22 2 28.0	- 5 32.3	+1.0586	0.5455	0.0368	+90	+44
15 Geminorum	6.5	0.29	5.4	20 50.7	9 54.1	+ 1 39.3	+0.1369	0.5470	0.0234	+45	-10
16 Geminorum	6.2	+0.29	-5.5	+20 33.1	9 59.2	+ 1 44.2	+0.4643	0.5470	+0.0233	+68	+ 7
$\nu$ Geminorum	4.2	0.30	5.5	20 16.2	10 28.3	+ 2 12.4	+0.7860	0.5471	0.0224	+90	+27
NEPTUNE				22 11.2	19 51.0	+11 16.7	-1.2020	0.5495	0.0052	-46	-68
<i>d</i> Geminorum	5.2	0.39	5.2	21 52.2	21 4.1	-11 32.6	-0.8461	0.5489	+0.0030	-13	-68
$\zeta$ Geminorum	4.0	0.44	5.5	20 42.3	23 2 58.5	- 5 49.8	+0.4236	0.5498	-0.0079	+65	+ 6
Lalande 13849	6.5	+0.46	-5.4	+21 24.5	5 46.8	- 3 7.0	-0.3797	0.5502	-0.0131	+15	-39
56 Geminorum	5.2	0.50	5.6	20 37.1	11 19.0	+ 2 14.2	+0.3889	0.5509	0.0234	+62	+ 4
B. A. C. 2455	6.4	0.52	5.3	21 43.2	13 35.6	+ 4 26.2	-0.8815	0.5510	0.0276	-16	-68
61 Geminorum	5.8	0.52	5.7	20 26.5	13 38.8	+ 4 29.3	+0.5227	0.5511	0.0277	+73	+11
63 Geminorum	5.3	0.52	5.4	21 38.1	14 0.1	+ 4 50.0	-0.7982	0.5511	0.0283	-10	-68
79 Geminorum	6.3	+0.58	-5.7	+20 32.3	22 8.2	-11 18.1	+0.1146	0.5517	-0.0434	+44	-13
B. A. C. 2605	6.2	0.60	6.0	19 33.7	24 1 19.2	- 8 13.4	+1.0371	0.5519	0.0493	+90	+41
85 Geminorum	5.2	0.62	5.9	20 7.7	3 2.4	- 6 33.6	+0.3287	0.5520	0.0524	+58	- 2
B.D. +20° 1976	6.3	0.63	5.9	20 4.2	5 25.9	- 4 14.9	+0.2617	0.5520	0.0568	+54	- 6
B.F. 1128	6.1	0.64	6.1	19 6.2	7 17.5	- 2 27.0	+1.2102	0.5521	0.0602	+90	+57
<i>d</i> <sup>1</sup> Cancri	5.7	+0.69	-6.3	+18 37.8	15 58.1	+ 5 56.3	+1.1347	0.5521	-0.0758	+90	+47
$\theta$ Cancri	5.5	0.71	6.3	18 24.4	19 48.5	+ 9 39.2	+1.0713	0.5521	0.0826	+90	+41
B. A. C. 2919	6.5	0.73	6.1	19 59.9	23 52.6	-10 24.8	-1.0108	0.5519	0.0897	-25	-70
$\epsilon$ Cancri	6.3	0.73	6.1	19 52.3	23 55.1	-10 22.4	-0.8784	0.5519	0.0897	-15	-70
<i>d</i> Cancri	4.1	0.74	6.4	18 29.7	25 1 54.8	- 8 26.7	+0.4378	0.5519	0.0932	+66	- 1
B. A. C. 2991	6.1	+0.75	-6.2	+19 10.7	4 44.3	- 5 42.8	-0.5747	0.5517	-0.0980	+ 5	-61
B. A. C. 3029	6.5	0.76	6.5	17 35.0	6 55.4	- 3 36.1	+0.9377	0.5515	0.1017	+90	+29
B. A. C. 3209	6.3	0.81	6.6	16 59.1	21 4.3	+10 5.0	-0.0204	0.5504	0.1246	+36	-28
8 Leonis	5.9	0.83	6.7	16 51.2	26 2 28.9	- 8 41.0	-0.5736	0.5499	0.1329	+ 5	-64
34 Leonis	6.4	0.86	6.9	13 48.8	18 51.7	+ 7 9.7	+0.3222	0.5480	0.1559	+56	-14
37 Leonis	5.5	+0.86	-6.8	+14 11.4	21 15.3	+ 9 28.7	-0.4586	0.5478	-0.1590	+12	-59
$\gamma$ Leonis	5.3	0.86	6.8	11 2.1	27 12 47.8	+ 0 31.0	+0.2889	0.5461	0.1771	+54	-17
Piazz xi, 12	5.8	0.85	6.7	8 34.1	28 0 39.8	-11 59.8	+0.7309	0.5450	0.1885	+90	+ 5
$\nu$ Virginis	4.2	0.81	6.3	7 2.9	15 56.8	+ 2 47.8	-0.6425	0.5443	0.2000	+ 2	-79
<i>b</i> Virginis	5.2	0.80	5.8	4 10.3	22 43.0	+ 9 21.0	+1.0105	0.5442	0.2039	+90	+22
MARCH.											
<i>c</i> Virginis	5.1	+0.76	-5.5	+ 3 49.7	1 8 31.0	- 5 9.6	-0.6518	0.5445	-0.2081	+ 2	-82
Piazz xii, 142	5.9	0.73	5.1	+ 2 21.9	17 7.8	+ 3 10.3	-0.9252	0.5452	0.2104	-15	-88
80 Virginis	5.6	+0.57	-2.6	- 4 55.4	2 20 9.0	+ 5 18.9	+0.9404	0.5499	-0.2090	+86	+16
Piazz xiii, 174	6.4	0.56	2.7	5 1.9	3 0 4.2	+ 9 6.4	+0.2354	0.5509	0.2075	+50	-24
<i>n</i> Virginis	6.5	0.55	2.3	6 22.4	2 6.4	+11 4.6	+1.1084	0.5515	0.2067	+84	+37
Lalande 26147	6.5	0.44	-1.7	7 6.4	15 47.4	+ 0 18.2	-0.8283	0.5559	0.1991	-52	-90
$\xi^1$ Libræ	5.7	0.30	+0.2	11 31.1	4 8 11.2	- 7 51.6	+0.5408	0.5624	0.1851	+67	- 7
$\xi^2$ Libræ	5.7	+0.29	0.0	-11 2.1	9 15.3	- 6 49.6	-0.1521	0.5629	-0.1840	+25	-46

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>		
		$\Delta\alpha$	$\Delta\delta$										
		<i>s</i>	<i>"</i>	<i>°</i>	<i>d</i>	<i>h</i>	<i>m</i>	<i>h</i>	<i>m</i>	<i>°</i>	<i>°</i>		
17 Libræ	6.4	+0.28	0.0	-10 46.9	4	9	54.4	- 6 12.0	-0.5308	0.5632	-0.1833	+ 5 -72	
18 Libræ	5.9	0.27	0.0	10 46.2		10	12.5	- 5 54.5	-0.5973	0.5633	0.1830	+ 1 -78	
Mayer 616	5.9	0.16	+0.6	12 2.3		21	11.6	+ 4 41.5	-1.2421	0.5683	0.1702	-48 -90	
$\gamma$ Libræ	4.1	0.11	1.6	14 28.8	5	2	13.3	+ 9 32.5	+0.4098	0.5707	0.1635	+55 -14	
Bradley 1987	6.5	0.07	1.7	14 44.7		5	37.4	-11 10.7	+0.1322	0.5724	0.1588	+38 -29	
$\eta$ Libræ	5.5	+0.07	+1.9	-15 22.6		5	54.0	-10 54.6	+0.7320	0.5725	-0.1584	+74 + 4	
$\theta$ Libræ	4.4	+0.02	2.4	16 27.4		10	3.3	- 6 54.3	+1.1858	0.5745	0.1522	+74 +39	
B.D.-14°, 4314	6.2	0.00	1.7	14 33.4		11	14.9	- 5 45.4	-0.9282	0.5751	0.1503	-23 -90	
49 Libræ	5.4	-0.02	2.3	16 15.5		12	51.6	- 4 12.2	+0.5640	0.5759	0.1478	+64 - 5	
$\chi$ Ophiuchi	4.9	0.15	3.2	18 14.7	6	0	2.0	+ 6 33.5	+1.0328	0.5813	0.1290	+72 +25	
$\phi$ Ophiuchi	4.4	-0.18	+2.6	-16 24.6		1	46.5	+ 8 14.1	-1.0534	0.5820	-0.1259	-37 -90	
24 Scorpii	5.0	0.24	2.9	17 33.7		6	4.7	-11 37.4	-0.4078	0.5841	0.1179	+ 4 -63	
B. A. C. 5700	6.1	0.32	3.5	19 23.5		12	24.8	- 5 31.7	+0.7403	0.5869	0.1056	+71 + 5	
B. A. C. 5712	6.5	0.34	3.0	18 6.2		13	31.6	- 4 27.4	-0.6827	0.5874	0.1034	-12 -90	
29 Ophiuchi	6.4	0.35	3.2	18 44.9		14	22.8	- 3 38.2	-0.1165	0.5878	0.1017	+18 -44	
B. A. C. 6081	6.4	-0.68	+3.2	-20 19.9	7	13	43.3	- 5 11.9	-0.3070	0.5959	-0.0510	+ 3 -56	
B. A. C. 6125	6.2	0.72	3.5	21 27.2		16	33.3	- 2 28.5	+0.6915	0.5966	0.0444	+66 + 3	
Lalande 33327	6.3	0.74	2.9	19 51.6		18	11.2	- 0 54.4	-0.9889	0.5969	0.0406	-39 -90	
$\mu$ Sagittarii	4.1	0.76	3.2	21 5.0		19	9.8	+ 0 1.8	+0.2094	0.5972	0.0383	+30 -25	
14 Sagittarii	5.6	0.76	3.5	21 44.2		19	21.1	+ 0 12.7	+0.8641	0.5972	0.0379	+68 +14	
15 Sagittarii	5.3	-0.76	+3.1	-20 45.3		19	44.6	+ 0 35.2	-0.1435	0.5973	-0.0370	+10 -45	
16 Sagittarii	5.9	0.76	3.0	20 24.9		19	45.0	+ 0 35.6	-0.4877	0.5973	0.0370	- 8 -70	
21 Sagittarii	5.0	0.82	2.9	20 35.5		23	44.9	+ 4 26.1	-0.4387	0.5980	0.0275	- 6 -66	
Bradley 2332	5.7	0.89	2.9	21 28.5	8	4	41.1	+ 9 10.6	+0.3476	0.5987	0.0157	+37 -17	
B. A. C. 6347	5.9	0.90	2.7	21 7.7		5	4.8	+ 9 33.3	-0.0083	0.5987	0.0148	+16 -37	
B.D.-21°, 5131	6.3	-0.93	+2.6	-21 5.7		7	36.3	+11 58.8	-0.0710	0.5990	-0.0087	+12 -41	
29 Sagittarii	5.3	0.94	2.3	20 25.8		9	19.9	-10 21.7	-0.7550	0.5991	0.0046	-26 -90	
30 Sagittarii	6.2	0.96	2.8	22 16.1		9	45.8	- 9 56.8	+1.1007	0.5991	0.0036	+68 +34	
33 Sagittarii	5.8	0.97	2.5	21 28.4		11	1.2	- 8 44.4	+0.2948	0.5992	-0.0005	+32 -20	
$\xi^1$ Sagittarii	5.1	0.99	2.2	20 46.7		12	20.7	- 7 28.1	-0.4067	0.5992	+0.0027	- 7 -64	
$\zeta^2$ Sagittarii	3.7	-0.99	+2.3	-21 13.7		12	29.3	- 7 19.8	+0.0494	0.5994	+0.0030	+18 -34	
$\sigma$ Sagittarii	3.9	1.03	2.3	21 52.7		15	12.8	- 4 42.8	+0.7222	0.5993	0.0095	+67 + 5	
$\pi$ Sagittarii	3.0	1.05	2.0	21 10.3		17	13.6	- 2 46.8	+0.0327	0.5993	0.0144	+18 -35	
B. A. C. 6550	6.3	1.04	1.6	19 57.0		17	15.6	- 2 44.9	-1.2010	0.5992	0.0145	-60 -90	
B. A. C. 6561	6.4	1.07	2.1	21 48.8		18	16.8	- 1 46.1	+0.6972	0.5992	0.0169	+65 + 3	
50 Sagittarii	5.5	-1.13	+1.8	-21 57.6		23	44.1	+ 3 28.2	+0.9750	0.5988	+0.0300	+68 +22	
B. A. C. 6671	6.1	1.15	1.5	21 30.3	9	1	33.1	+ 5 12.8	+0.5734	0.5987	0.0343	+54 - 4	
$f$ Sagittarii	5.1	1.21	+0.5	19 59.1		7	41.6	+11 6.8	-0.7087	0.5978	0.0488	-20 -90	
$\sigma$ Capricorni	5.5	1.34	-0.8	19 24.6		20	51.2	- 0 14.5	-0.4513	0.5946	0.0787	- 2 -67	
$\pi$ Capricorni	5.1	1.36	1.3	18 31.0	10	0	2.9	+ 2 49.8	-1.0920	0.5936	0.0856	-43 -90	
$\sigma$ Capricorni	5.6	-1.37	-1.3	-18 53.5		1	4.9	+ 3 49.5	-0.6234	0.5931	+0.0879	-11 -84	
$\nu$ Capricorni	5.3	1.40	1.8	18 28.0		5	11.4	+ 7 46.4	-0.6751	0.5917	0.0966	-13 -90	
B.D.-18°, 5783	6.4	1.43	2.1	18 22.8		8	58.0	+11 24.4	-0.3841	0.5902	0.1044	+ 4 -62	
19 Capricorni	5.7	1.45	2.4	18 16.6		11	11.7	-10 27.1	-0.2512	0.5893	0.1088	+12 -52	
20 Capricorni	6.2	1.48	2.3	19 23.8		13	8.8	- 8 34.4	+1.1011	0.5884	0.1127	+71 +32	
21 Capricorni	6.5	-1.47	-2.7	-17 53.7		13	41.0	- 8 3.5	-0.3618	0.5882	+0.1138	+ 6 -60	
$\theta$ Capricorni	4.1	1.48	3.0	17 36.2		15	46.2	- 6 3.0	-0.4153	0.5874	0.1178	+ 3 -64	
B.D.-17°, 6216	6.1	1.50	3.3	17 43.8		19	33.3	- 2 24.5	+0.1733	0.5856	0.1249	+36 -27	
30 Capricorni	5.4	1.52	3.3	18 22.6		20	43.6	- 1 16.8	+0.9764	0.5850	0.1271	+72 +21	
31 Capricorni	6.3	1.51	3.4	17 51.2		20	51.5	- 1 9.2	+0.4626	0.5850	0.1274	+55 -11	
$\iota$ Capricorni	4.3	-1.52	-3.6	-17 13.9		22	31.4	+ 0 27.0	+0.0457	0.5842	+0.1304	+30 -34	
$\gamma$ Capricorni	3.7	1.56	4.5	17 5.0	11	5	59.7	+ 7 38.6	+0.9191	0.5804	0.1433	+73 +16	
44 Capricorni	6.0	1.54	4.9	14 49.6		7	17.1	+ 8 53.1	-1.1922	0.5798	0.1454	-46 -90	
45 Capricorni	5.8	1.55	4.9	15 10.6		7	40.9	+ 9 16.1	-0.7774	0.5795	0.1461	-14 -90	
$\delta$ Capricorni	2.9	-1.56	-4.8	-16 33.1		8	56.2	+10 28.6	+0.8059	0.5789	+0.1481	+74 + 9	
NEW MOON.													

NEW MOON.

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.								Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	J'	"	J''	N.	S.			
		$\Delta\alpha$	$\Delta\delta$											
		s	"	°	d	h	m							
Lalande 2632	6.5	-1.39	-10.7	+ 3 3.0	15	14	44.1	-11 7.0	+0.2084	0.5352	+0.2054	+49 -25		
$\nu$ Piscium	4.6	1.36	10.6	5 0.9	21	55.9	- 4 8.5	-0.4118	0.5339	0.2025	+16 -62			
Piazz i, 249	6.5	1.29	10.3	7 17.2	16	9	34.3	+ 7 8.5	-0.5223	0.5324	0.1958	+ 9 -69		
64 Ceti	5.8	1.28	10.1	8 7.9	12	49.1	+10 17.3	-0.7972	0.5321	0.1936	- 7 -82			
$\xi$ Ceti	4.5	1.27	10.0	8 24.5	13	38.0	+11 4.7	-0.9362	0.5321	0.1930	-16 -82			
25 Arietis	6.5	-1.23	- 9.7	+ 9 47.0	20	49.3	- 5 57.2	-1.0496	0.5317	+0.1876	-24 -80			
$\xi$ Ceti	4.5	1.22	10.1	8 2.4	21	12.4	- 5 34.8	+0.8992	0.5317	0.1872	+90 +16			
B. F. 310	6.3	1.22	9.9	9 8.9	21	54.7	- 4 53.8	-0.1616	0.5316	0.1867	+28 -44			
85 Ceti	6.3	1.18	9.6	10 20.6	17	4	20.6	+ 1 20.3	-0.2685	0.5316	0.1811	+23 -48		
$\mu$ Ceti	4.3	1.16	9.7	9 43.2	5	33.9	+ 2 31.4	+0.6263	0.5316	0.1800	+81 0			
W. B. ii, 1033	5.8	-1.10	- 8.9	+12 49.6	16	15.0	-11 7.2	-0.8729	0.5318	+0.1695	-12 -77			
B.D.+12°, 473	6.2	1.03	9.0	12 17.9	18	1	6.5	- 2 31.9	+1.1626	0.5323	0.1598	+90 +39		
$f$ Tauri	4.3	1.00	8.9	12 37.0	4	26.1	+ 0 41.5	+1.3243	0.5327	0.1559	+90 +65			
Mayer 121	6.4	0.08	8.1	15 7.4	7	50.0	+ 3 59.1	-0.8719	0.5329	0.1518	-13 -75			
Piazz iii, 249	6.1	0.86	7.2	17 5.4	22	42.9	- 5 35.6	-0.9100	0.5348	0.1326	-16 -73			
B. D.+16°, 569	6.2	-0.84	- 7.2	+17 2.2	19	0	56.5	- 3 26.2	-0.5606	0.5351	+0.1295	+ 6 -63		
$\delta$ Tauri	3.9	0.79	7.1	17 19.4	6	2.5	+ 1 30.3	-0.2337	0.5358	0.1223	+25 -41			
63 Tauri	5.7	0.78	7.3	16 33.5	6	17.5	+ 1 44.8	+0.6373	0.5359	0.1219	+84 + 7			
$\delta$ Tauri	4.9	0.78	7.1	17 13.6	6	36.7	+ 2 3.5	-0.0588	0.5359	0.1214	+34 -31			
$\delta$ Tauri	4.3	0.78	6.9	17 42.8	7	17.1	+ 2 42.6	-0.5127	0.5360	0.1205	+ 9 -59			
B.D.+17°, 750	6.2	-0.74	- 6.8	+17 49.1	11	13.7	+ 6 31.7	-0.1651	0.5366	+0.1147	+28 -36			
Mayer 177	6.1	0.69	6.4	18 33.9	17	24.9	-11 28.6	-0.3069	0.5377	0.1054	+20 -43			
$i$ Tauri	5.2	0.66	6.4	18 40.8	19	53.3	- 9 4.9	-0.1782	0.5381	0.1015	+27 -35			
B. D.+19°, 811	6.2	0.65	6.1	19 20.0	21	37.4	- 7 24.2	-0.7249	0.5384	0.0988	- 4 -71			
Mayer 198	6.3	0.60	5.9	19 40.7	20	2	44.0	- 2 27.3	-0.6211	0.5392	0.0907	+ 2 -64		
$m$ Tauri	5.0	-0.58	- 6.2	+18 31.1	3	39.2	- 1 33.8	+0.7409	0.5394	+0.0892	+90 +17			
$l$ Tauri	5.2	0.59	5.7	20 17.7	3	49.3	- 1 24.1	-1.2046	0.5394	0.0889	-44 -70			
107 Tauri	6.5	0.58	5.8	19 44.3	4	19.7	- 0 54.6	-0.5453	0.5395	0.0881	+ 6 -58			
B. A. C. 1639	6.2	0.53	5.6	20 2.2	9	20.5	+ 3 56.7	-0.4537	0.5404	0.0799	+11 -50			
B. A. C. 1651	6.5	0.52	5.8	19 43.1	10	9.8	+ 4 44.4	-0.0383	0.5405	0.0786	+35 -25			
Piazz v, 125	6.1	-0.46	- 5.4	+20 24.4	16	15.0	+10 37.8	-0.3521	0.5415	+0.0683	+17 -42			
$\zeta$ Tauri	3.0	0.44	5.1	21 5.1	18	9.1	-11 31.7	-0.9746	0.5418	0.0651	-22 -69			
B. D.+19°, 1110	6.0	0.36	5.5	19 50.6	21	1	13.3	+ 4 41.1	+0.8161	0.5429	0.0529	+90 +25		
$\chi^1$ Orionis	4.5	0.36	5.3	20 15.5	2	10.4	- 3 45.9	+0.4064	0.5430	0.0512	+64 + 2			
$\lambda^2$ Orionis	5.8	0.35	5.4	19 43.8	2	26.5	- 3 30.2	+1.0037	0.5431	0.0507	+90 +38			
$\chi^3$ Orionis	5.1	-0.31	- 5.4	+19 41.5	6	29.6	+ 0 25.1	+1.2383	0.5437	+0.0436	+90 +62			
$\chi^4$ Orionis	4.7	0.30	5.2	20 8.4	6	42.3	+ 0 37.3	+0.7513	0.5437	0.0432	+90 +22			
68 Orionis	5.7	0.26	5.3	19 48.6	10	33.6	+ 4 21.1	+1.2689	0.5443	0.0363	+90 +68			
15 Geminorum	6.5	0.18	4.8	20 50.7	18	0.3	+11 33.4	+0.3444	0.5452	0.0229	+59 + 2			
16 Geminorum	6.2	0.18	4.9	20 33.1	18	5.4	+11 38.3	+0.6718	0.5452	0.0228	+90 +20			
$\nu$ Geminorum	4.2	-0.18	- 5.0	+20 16.2	18	34.5	-11 53.6	+0.9933	0.5453	+0.0219	+90 +40			
NEPTUNE				22 13.2	22	3	35.5	- 3 10.3	-1.0374	0.5464	0.0054	-28 -68		
$d$ Geminorum	5.2	-0.06	4.3	21 52.2	5	12.3	- 1 36.7	-0.6453	0.5465	+0.0024	0 -58			
$\zeta$ Geminorum	4.0	0.00	4.7	20 42.4	11	8.2	+ 4 7.6	+0.6217	0.5471	-0.0085	+84 +18			
Lalande 13849	6.5	+0.03	4.5	21 24.5	13	57.3	+ 6 51.1	-0.1844	0.5474	0.0137	+26 -27			
$\delta$ Geminorum	3.5	+0.08	- 4.1	+22 9.2	18	38.2	+11 22.8	-1.0890	0.5477	-0.0224	-32 -68			
56 Geminorum	5.2	0.09	4.6	20 37.1	19	31.4	-11 45.7	+0.5809	0.5477	0.0240	+79 +14			
B. A. C. 2455	6.4	0.11	4.2	21 43.3	21	48.7	- 9 32.8	-0.6928	0.5479	0.0282	- 3 -65			
61 Geminorum	5.8	0.12	4.6	20 26.6	21	52.0	- 9 29.7	+0.7130	0.5479	0.0283	+90 +21			
63 Geminorum	5.3	0.12	4.2	21 38.1	22	13.4	- 9 9.0	-0.6099	0.5479	0.0290	+ 2 -57			
79 Geminorum	6.3	+0.21	- 4.5	+20 32.3	23	6	24.7	- 1 13.8	+0.2970	0.5483	-0.0441	+56 - 3		
B. A. C. 2605	6.2	0.24	4.8	19 33.7	9	36.9	+ 1 52.1	+1.2179	0.5483	0.0499	+90 +58			
85 Geminorum	5.2	0.26	4.6	20 7.7	11	20.8	+ 3 32.6	+0.5068	0.5484	0.0531	+72 + 7			
B.D.+20°, 1976	6.3	0.28	4.6	20 4.2	13	45.3	+ 5 52.3	+0.4373	0.5484	0.0574	+66 + 3			
Piazz viii, 42	6.0	0.37	4.3	21 2.4	22	54.5	- 9 16.5	-1.2243	0.5486	0.0738	-48 -69			
$\theta$ Cancri	5.5	+0.42	- 5.1	+18 24.5	24	4	14.1	- 4 7.4	+1.2321	0.5484	-0.0833	+90 +57		



## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				°	°
39 Cancrī	6.5	+0.45	-4.5	+20 20.1	24 8 12.2	- 0 17.2	-1.2135	0.5483	-0.0901	-45	-70
40 Cancrī	6.5	0.46	4.5	20 17.9	8 14.7	- 0 14.8	-1.1775	0.5483	0.0902	-40	-70
B. A. C. 2919	6.5	0.46	4.6	19 59.9	8 19.9	- 0 9.6	-0.8575	0.5483	0.0904	-13	-70
$\epsilon$ Cancrī	6.3	0.46	4.6	19 52.4	8 22.4	- 0 7.2	-0.7250	0.5483	0.0904	-5	-70
$\delta$ Cancrī	4.1	0.48	5.1	18 29.7	10 22.9	+ 1 49.3	+0.5900	0.5483	0.0939	+80	+ 8
B. A. C. 2991	6.1	+0.50	-4.8	+19 10.7	13 13.5	+ 4 34.3	-0.4271	0.5482	-0.0987	+13	-50
B. A. C. 3029	6.5	0.52	5.2	17 35.1	15 25.5	+ 6 41.9	+1.0839	0.5481	0.1024	+90	+39
B. A. C. 3209	6.3	0.63	5.3	16 59.1	25 5 39.2	- 3 32.3	+0.1045	0.5475	0.1255	+43	-22
8 Leonis	5.9	0.67	5.3	16 51.2	11 5.2	+ 1 43.1	-0.4569	0.5472	0.1338	+12	-56
34 Leonis	6.4	0.79	6.0	13 48.8	26 3 30.5	- 6 23.6	+0.4103	0.5464	0.1572	+63	- 9
37 Leonis	5.5	+0.80	-5.9	+14 11.4	5 54.2	- 4 4.4	-0.3732	0.5463	-0.1604	+17	-53
$\gamma$ Leonis	5.3	0.88	6.3	11 2.1	21 25.2	+10 56.3	+0.3429	0.5460	0.1790	+58	-15
Piazzī xi, 12	5.8	0.93	6.5	8 34.1	27 9 13.6	- 1 38.2	+0.7584	0.5461	0.1910	+90	+ 7
$\nu$ Virginis	4.2	0.98	6.5	7 2.9	28 0 22.6	-10 58.5	-0.6393	0.5467	0.2031	+ 2	-79
$\delta$ Virginis	5.2	1.00	6.5	4 10.3	7 3.9	- 4 30.2	+0.9878	0.5474	0.2072	+90	+20
$\epsilon$ Virginis	5.1	+1.01	-6.3	+ 3 49.7	16 43.6	+ 4 50.6	-0.6829	0.5485	-0.2118	0	-85
Piazzī xii, 142	5.9	1.03	6.1	+ 2 21.9	29 1 11.8	-10 57.8	-0.9720	0.5500	0.2145	-18	-88
80 Virginis	5.6	1.03	4.8	- 4 55.4	30 3 40.1	- 9 22.3	+0.8198	0.5566	0.2135	+85	+ 8
Piazzī xiii, 174	6.4	1.02	4.7	5 1.9	7 29.8	- 5 40.4	+0.1147	0.5578	0.2121	+43	-31
$\eta$ Virginis	6.5	1.02	4.5	6 22.5	9 29.1	- 3 45.0	+1.0634	0.5585	0.2113	+84	+25
Lalande 26147	6.5	+0.98	-3.8	- 7 6.4	22 50.5	+ 9 8.8	-0.9659	0.5633	-0.2036	-19	-90
$\zeta$ Libræ	5.7	0.91	2.3	11 31.2	31 14 50.3	+ 0 35.1	+0.3621	0.5699	0.1891	+55	-18
$\epsilon$ Libræ	5.7	0.91	2.3	11 2.1	15 52.7	+ 1 35.1	-0.3247	0.5704	0.1880	+16	-57
17 Libræ	6.4	0.90	2.4	10 46.9	16 30.8	+ 2 12.0	-0.7002	0.5707	0.1873	- 5	-90
18 Libræ	5.9	+0.90	-2.4	-10 46.3	16 48.5	+ 2 29.1	-0.7665	0.5708	-0.1870	- 9	-90

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$\gamma$ Libræ	4.1	+0.80	-0.7	-14 28.8	1 8 26.8	- 6 26.5	+0.2098	0.5777	-0.1668	+43	-26
Bradley 1987	6.5	0.78	0.6	14 44.7	11 46.4	- 3 14.3	-0.0688	0.5792	0.1619	+27	-41
$\eta$ Libræ	5.5	+0.78	-0.4	-15 22.6	12 2.6	- 2 58.7	+0.5252	0.5793	-0.1615	+62	- 8
$\theta$ Libræ	4.4	0.75	+0.2	16 27.4	16 6.7	+ 0 56.4	+0.9710	0.5810	0.1551	+74	+20
B.D.-14°, 4314	6.2	0.73	-0.3	14 33.5	17 16.7	+ 2 3.8	-1.1256	0.5815	0.1532	-38	-90
49 Libræ	5.4	0.71	+0.1	16 15.6	18 51.5	+ 3 35.1	+0.3522	0.5822	0.1505	+50	-18
$\chi$ Ophiuchi	4.9	0.62	1.2	18 14.7	2 5 49.1	- 9 51.9	+0.8089	0.5867	0.1311	+72	+ 9
$\phi$ Ophiuchi	4.4	+0.60	+0.8	-16 24.6	7 31.9	- 8 13.1	-1.2638	0.5874	-0.1279	-58	-90
24 Scorpii	5.0	0.55	1.3	17 33.7	11 45.8	- 4 8.9	-0.6258	0.5890	0.1197	- 9	-83
B. A. C. 5700	6.1	0.49	2.0	19 23.5	18 0.3	+ 1 51.3	+0.5121	0.5911	0.1070	+56	- 9
B. A. C. 5712	6.5	0.47	1.6	18 6.2	19 6.2	+ 2 54.6	-0.9039	0.5914	0.1048	-27	-90
29 Ophiuchi	6.4	0.46	1.9	18 44.9	19 56.7	+ 3 43.2	-0.3411	0.5917	0.1030	+ 6	-59
B. A. C. 5746	6.2	+0.45	+2.5	-20 21.8	21 5.1	+ 4 48.9	+1.1717	0.5921	-0.1006	+70	+39
$\xi$ Ophiuchi	4.4	0.38	2.8	21 -0.8	3 34.4	+11 3.1	+1.2195	0.5939	0.0866	+69	+46
58 Ophiuchi	4.8	0.26	3.2	21 38.3	12 30.0	- 4 22.3	+1.1672	0.5958	0.0664	+69	+40
B. A. C. 6081	6.4	0.17	3.0	20 19.9	19 4.8	+ 1 56.9	-0.5381	0.5968	0.0512	-10	-75
B. A. C. 6125	6.2	0.13	3.3	21 27.2	21 54.1	+ 4 39.6	+0.4593	0.5971	0.0445	+47	-11
Lalande 33327	6.3	+0.11	+2.8	-19 51.6	23 31.7	+ 6 13.4	-1.2199	0.5972	-0.0406	-59	-90
$\mu$ Sagittarii	4.1	0.09	3.2	21 5.0	4 0 30.2	+ 7 9.6	-0.0223	0.5973	0.0383	+17	-39
14 Sagittarii	5.6	0.09	3.4	21 44.2	0 41.4	+ 7 20.3	+0.6322	0.5974	0.0379	+60	- 1
15 Sagittarii	5.3	0.09	3.1	20 45.3	1 4.9	+ 7 42.9	-0.3750	0.5974	0.0369	- 2	-62
16 Sagittarii	5.9	0.09	3.0	20 24.9	1 5.2	+ 7 43.2	-0.7190	0.5974	0.0369	-21	-90
21 Sagittarii	5.0	+0.03	+3.0	-20 35.5	5 4.9	+11 33.4	-0.6701	0.5975	-0.0274	-19	-90
Bradley 2332	5.7	-0.04	3.3	21 28.5	10 1.2	- 7 42.0	+0.1175	0.5975	0.0155	+23	-31
B. A. C. 6347	5.9	0.05	3.2	21 7.7	10 25.1	- 7 19.0	-0.2387	0.5975	0.0145	+ 3	-52
B.D.-21°, 5131	6.3	0.08	3.1	21 5.7	12 56.9	- 4 53.3	-0.3009	0.5974	0.0084	- 1	-56
28 Sagittarii	5.6	0.09	3.6	22 29.3	13 20.0	- 4 31.0	+1.1068	0.5974	0.0075	+68	+34
29 Sagittarii	5.3	-0.11	+2.9	-20 25.8	14 40.8	- 3 13.4	-0.9858	0.5973	-0.0043	-42	-90

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S				AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>	
		$\Delta\alpha$	$\Delta\delta$									
		<i>s</i>	<i>"</i>	<i>° ' "</i>	<i>d h m</i>	<i>h m</i>				<i>°</i>	<i>°</i>	
30 Sagittarii	6.2	-0.12	+3.5	-22 16.1	4 15 6.8	- 2 48.4	+0.8736	0.5972	-0.0032	+68	+15	
33 Sagittarii	5.8	0.13	3.3	21 28.4	16 22.4	- 1 35.8	+0.0667	0.5971	-0.0002	+18	-33	
$\xi^1$ Sagittarii	5.1	0.15	3.0	20 46.7	17 42.3	- 0 19.1	-0.6361	0.5970	+0.0030	-17	-86	
$\xi^2$ Sagittarii	3.7	0.15	3.1	21 13.7	17 51.1	- 0 10.7	-0.1787	0.5969	0.0034	+ 5	-48	
$\sigma$ Sagittarii	3.9	0.19	3.3	21 52.6	20 35.3	+ 2 27.1	+0.4970	0.5966	0.0100	+46	- 9	
$\pi$ Sagittarii	3.0	-0.22	+3.0	-21 10.3	22 36.9	+ 4 23.9	-0.1936	0.5963	+0.0148	+ 6	-49	
B. A. C. 6561	6.4	0.24	3.2	21 48.7	23 40.5	+ 5 25.0	+0.4735	0.5961	0.0173	+45	-10	
50 Sagittarii	5.5	0.32	3.1	21 57.6	5 5 10.5	+10 41.9	+0.7557	0.5951	0.0304	+68	+ 7	
B. A. C. 6671	6.1	0.34	2.9	21 30.3	7 0 5	-11 32.4	+0.3536	0.5946	0.0347	+39	-17	
$f$ Sagittarii	5.1	0.42	2.1	19 59.1	13 13.0	- 5 34.3	-0.9312	0.5931	0.0491	-34	-90	
$\sigma$ Capricorni	5.5	-0.60	+1.4	-19 24.5	6 2 33.9	+ 7 15.6	-0.6627	0.5884	+0.0789	-14	-89	
$\sigma$ Capricorni	5.6	0.65	1.0	18 53.5	6 51.9	+11 23.7	-0.8322	0.5866	0.0880	-24	-90	
$\nu$ Capricorni	5.3	0.70	0.7	18 28.0	11 2.9	- 8 34.7	-0.8803	0.5848	0.0967	-26	-90	
B.D.-18°, 5783	6.4	0.75	0.6	18 22.7	14 53.8	- 4 52.6	-0.5830	0.5830	0.1044	- 7	-79	
19 Capricorni	5.7	0.77	0.2	18 16.5	17 10.2	- 2 41.2	-0.4464	0.5820	0.1089	+ 1	-67	
20 Capricorni	6.2	-0.80	+0.4	-19 23.8	19 9.6	- 0 46.3	+0.9203	0.5810	+0.1127	+71	+17	
21 Capricorni	6.5	0.80	0.0	17 53.6	19 42.5	- 0 14.6	-0.5550	0.5807	0.1137	- 4	-76	
$\theta$ Capricorni	4.1	0.82	-0.3	17 36.2	21 50.4	+ 1 48.6	-0.6064	0.5797	0.1178	- 7	-81	
B.D.-17°, 6216	6.1	0.86	0.4	17 43.8	7 1 42.4	+ 5 32.1	-0.0073	0.5778	0.1248	+26	-38	
30 Capricorni	5.4	0.88	0.3	18 22.5	2 54.3	+ 6 41.4	+0.8049	0.5772	0.1270	+72	+ 9	
31 Capricorni	6.3	-0.88	-0.5	-17 51.2	3 2.3	+ 6 49.1	+0.2865	0.5771	+0.1272	+43	-21	
$\epsilon$ Capricorni	4.3	0.89	0.8	17 13.9	4 44.4	+ 8 27.4	-0.1321	0.5763	0.1302	+20	-45	
$\gamma$ Capricorni	3.7	0.97	1.3	17 5.0	12 23.0	- 8 10.6	+0.7611	0.5723	0.1430	+73	+ 6	
45 Capricorni	5.8	0.98	2.0	15 10.6	14 6.5	- 6 30.8	-0.9497	0.5714	0.1457	-25	-90	
$\delta$ Capricorni	2.9	0.99	1.8	16 33.0	15 23.6	- 5 16.5	+0.6515	0.5707	0.1478	+71	- 1	
$\iota$ Aquarii	4.4	-1.06	-2.9	-14 19.3	23 54.9	+ 2 56.7	-0.3293	0.5662	+0.1603	+13	-57	
39 Aquarii	6.2	1.09	2.9	14 39.2	8 2 33.8	+ 5 30.0	+0.4415	0.5649	0.1639	+57	-13	
42 Aquarii	5.5	1.09	3.4	13 17.8	4 31.1	+ 7 23.2	-0.6358	0.5639	0.1665	- 3	-83	
45 Aquarii	6.1	1.10	3.3	13 46.3	5 29.8	+ 8 19.9	+0.0184	0.5634	0.1677	+32	-36	
50 Aquarii	5.9	1.12	3.4	14 0.1	7 55.6	+10 40.6	+0.6680	0.5621	0.1708	+74	0	
Bradley 2961	6.2	-1.14	-3.8	-13 23.6	10 25.8	-10 54.3	+0.4697	0.5608	+0.1738	+61	-12	
70 Aquarii	6.1	1.18	4.9	11 2.9	18 50.0	- 2 47.3	-0.4577	0.5566	0.1831	+ 9	-66	
74 Aquarii	5.8	1.21	4.8	12 6.8	21 6.4	- 0 35.5	+1.0656	0.5555	0.1853	+78	+26	
$\psi^1$ Aquarii	4.5	1.25	5.9	9 35.8	9 7 28.9	+ 9 26.3	+0.4246	0.5508	0.1945	+60	-14	
$\chi$ Aquarii	5.3	1.25	6.2	8 14.1	7 57.2	+ 9 53.7	-0.9003	0.5506	0.1948	-16	-90	
$\psi^2$ Aquarii	4.6	-1.26	-5.9	- 9 41.5	8 26.4	+10 22.0	+0.7110	0.5504	+0.1952	+80	+ 2	
$\psi^3$ Aquarii	5.2	1.27	5.9	10 7.3	8 55.9	+10 50.6	+1.2544	0.5502	0.1956	+80	+44	
B. A. C. 8214	6.5	1.29	6.7	7 58.9	16 44.9	- 5 35.9	+0.5749	0.5469	0.2008	+73	- 6	
Mayer 1012	6.3	1.32	7.3	- 6 53.9	22 56.6	+ 0 23.9	+0.6996	0.5444	0.2042	+83	+ 1	
NEW MOON.												
Mayer 121	6.4	-1.26	-8.6	+15 7.4	14 16 12.5	- 9 50.5	-0.6710	0.5354	+0.1543	0	-73	
B. A. C. 1239	6.3	1.21	8.0	17 1.9	15 3 23.2	+ 0 59.3	-1.1172	0.5370	0.1397	-32	-73	
Piazzi iii, 249	6.1	1.19	7.8	17 5.4	6 59.6	+ 4 28.9	-0.6861	0.5375	0.1347	- 1	-72	
B.D.+16°, 569	6.2	1.18	7.8	17 2.2	9 12.2	+ 6 37.3	-0.3339	0.5378	0.1316	+19	-47	
$\delta^1$ Tauri	3.9	-1.15	-7.6	+17 19.4	14 16.0	+11 31.5	-0.0004	0.5386	+0.1243	+37	-27	
63 Tauri	5.7	1.14	7.7	16 33.5	14 30.9	+11 46.0	+0.8702	0.5387	0.1239	+90	+22	
$\delta^2$ Tauri	4.9	1.14	7.6	17 13.6	14 50.0	-11 55.5	+0.1751	0.5387	0.1234	+48	-18	
$\delta^3$ Tauri	4.3	1.14	7.4	17 42.8	15 30.1	-11 16.7	-0.2775	0.5388	0.1224	+22	-43	
B.D.+17°, 750	6.2	1.12	7.3	17 49.1	19 25.1	- 7 29.0	+0.0749	0.5394	0.1166	+42	-23	
Mayer 177	6.1	-1.08	-6.9	+18 33.9	16 1 33.7	- 1 32.0	-0.0599	0.5403	+0.1070	+34	-29	
$\epsilon$ Tauri	5.2	1.07	6.8	18 40.8	4 1.0	+ 0 50.6	+0.0713	0.5406	0.1032	+42	-21	
B.D.+19°, 811	6.2	1.05	6.5	19 20.0	5 44.5	+ 2 30.7	-0.4732	0.5408	0.1004	+11	-53	
Mayer 198	6.3	1.02	6.3	19 40.6	10 49.1	+ 7 25.7	-0.3644	0.5416	0.0921	+17	-45	
$m$ Tauri	5.0	1.00	6.5	18 31.1	11 43.9	+ 8 18.7	+0.9977	0.5417	0.0906	+90	+34	
$l$ Tauri	5.2	-1.02	-6.1	+20 17.7	11 54.0	+ 8 28.5	-0.9466	0.5417	+0.0903	-19	-70	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.	
		Δα	Δδ									
		s	"	"	d h m	h m				°	°	
107 Tauri	6.5	-1.01	-6.2	+19 44.3	16 12 24.2	+ 8 57.7	-0.2872	0.5417	+0.0895	+21	-40	
B. A. C. 1639	6.2	0.97	5.9	20 2.2	17 23.2	-10 12.8	-0.1912	0.5424	0.0811	+27	-34	
B. A. C. 1651	6.5	0.96	6.0	19 43.1	18 12.3	- 9 25.3	+0.2248	0.5425	0.0798	+51	-11	
Piazz v, 125	6.1	0.91	5.6	20 24.4	17 0 15.6	- 3 33.8	-0.0841	0.5432	0.0694	+33	-26	
ζ Tauri	3.0	0.90	5.3	21 5.1	2 9.2	- 1 43.8	-0.7054	0.5434	0.0661	- 3	-68	
B.D.+19°, 1110	6.0	-0.84	-5.4	+19 50.6	9 11.7	+ 5 5.0	+1.0907	0.5441	+0.0537	+90	+45	
χ <sup>1</sup> Orionis	4.5	0.82	5.3	20 15.5	10 8.6	+ 6 0.1	+0.6813	0.5442	0.0520	+90	+18	
χ <sup>4</sup> Orionis	4.7	0.79	5.1	20 8.4	14 39.7	+10 22.6	+1.0291	0.5446	0.0439	+90	+41	
B. A. C. 1970	6.0	0.76	4.4	22 12.2	17 17.3	-11 5.1	-1.1476	0.5448	0.0391	-38	-68	
15 Geminorum	6.5	0.67	4.5	20 50.7	18 1 56.8	- 2 42.5	+0.6271	0.5453	0.0233	+85	+17	
16 Geminorum	6.2	-0.67	-4.6	+20 33.1	2 1.9	- 2 37.5	+0.9550	0.5454	+0.0232	+90	+37	
NEPTUNE	..	..	..	22 13.2	11 59.7	+ 7 0.8	-0.7539	0.5450	0.0048	- 7	-68	
d Geminorum	5.2	0.56	3.8	21 52.2	13 9.3	+ 8 8.1	-0.3617	0.5458	+0.0026	+17	-36	
ζ Geminorum	4.0	0.49	4.0	20 42.4	19 6.2	-10 6.7	+0.9093	0.5458	-0.0084	+90	+36	
Lalande 13849	6.5	0.46	3.8	21 24.5	21 55.9	- 7 22.5	+0.1012	0.5458	0.0136	+43	-11	
δ Geminorum	3.5	-0.42	-3.2	+22 9.2	19 2 38.0	- 2 49.6	-0.8064	0.5457	-0.0223	-10	-68	
56 Geminorum	5.2	0.40	3.7	20 37.1	3 31.5	- 1 57.8	+0.8688	0.5457	0.0240	+90	+32	
B. A. C. 2455	6.4	0.38	3.3	21 43.3	5 49.5	+ 0 15.8	-0.4093	0.5457	0.0282	+14	-42	
61 Geminorum	5.8	0.37	3.7	20 26.6	5 52.9	+ 0 19.0	+1.0013	0.5457	0.0283	+90	+40	
63 Geminorum	5.3	0.38	3.3	21 38.1	6 14.4	+ 0 39.8	-0.3261	0.5457	0.0290	+19	-36	
79 Geminorum	6.3	-0.28	-3.4	+20 32.3	14 28.8	+ 8 38.1	+0.5828	0.5454	-0.0441	+80	+13	
85 Geminorum	5.2	0.22	3.4	20 7.7	19 27.4	-10 33.0	+0.7921	0.5452	0.0531	+90	+24	
B.D.+20°, 1976	6.3	0.19	3.4	20 4.2	21 53.1	- 8 12.1	+0.7217	0.5451	0.0574	+90	+19	
Piazz viii, 42	6.0	0.09	2.8	21 2.4	20 7 7.6	+ 0 44.4	-0.9518	0.5445	0.0738	-20	-69	
η Cancri	5.4	-0.03	2.8	20 45.4	13 0.3	+ 6 25.6	-1.1027	0.5441	0.0841	-32	-69	
39 Cancri	6.5	+0.01	-2.8	+20 20.1	16 31.7	+ 9 50.1	-0.9470	0.5438	-0.0901	-19	-70	
40 Cancri	6.5	0.02	2.8	20 18.0	16 34.1	+ 9 52.5	-0.9108	0.5438	0.0902	-16	-70	
B. A. C. 2919	6.5	0.02	2.9	19 59.9	16 39.4	+ 9 57.6	-0.5892	0.5438	0.0903	+ 4	-61	
ε Cancri	6.3	0.02	3.0	19 52.4	16 41.9	+10 0.0	-0.4560	0.5438	0.0904	+12	-51	
δ Cancri	4.1	0.05	3.5	18 29.7	18 44.0	+11 58.2	+0.8645	0.5436	0.0938	+90	+24	
B. A. C. 2991	6.1	+0.08	-3.1	+19 10.7	21 36.7	- 9 14.7	-0.1602	0.5434	-0.0957	+28	-34	
B. A. C. 3209	6.3	0.26	3.6	16 59.2	21 14 15.9	+ 6 52.3	+0.3589	0.5420	0.1254	+60	- 8	
8 Leonis	5.9	0.32	3.6	16 51.2	19 46.6	-11 47.6	-0.2119	0.5417	0.1337	+26	-40	
34 Leonis	6.4	0.49	4.2	13 48.8	22 12 26.4	+ 4 20.2	+0.6376	0.5408	0.1571	+83	+ 4	
37 Leonis	5.5	0.51	4.0	14 11.5	14 52.1	+ 6 41.2	-0.1536	0.5407	0.1603	+29	-40	
ι Leonis	5.3	+0.66	-4.7	+11 2.2	23 6 36.0	- 2 4.9	+0.5387	0.5408	-0.1792	+73	- 4	
Piazz xi, 12	5.8	0.77	5.1	8 34.1	18 32.8	+ 9 29.0	+0.9314	0.5414	0.1914	+90	+18	
ν Virginis	4.2	0.90	5.2	7 2.9	24 9 50.2	+ 0 17.0	-0.5029	0.5432	0.2041	+10	-68	
δ Virginis	5.2	0.95	5.6	4 10.3	16 34.0	+ 6 47.8	+1.1091	0.5444	0.2085	+90	+29	
B.D.+6°, 2543	6.5	0.95	5.2	6 4.6	18 22.8	+ 8 33.1	-1.2521	0.5448	0.2096	-41	-84	
ε Virginis	5.1	+1.01	-5.4	+ 3 49.7	25 2 16.0	- 7 49.0	-0.5851	0.5466	-0.2136	+ 6	-76	
Piazz xii, 142	5.9	1.07	5.4	+ 2 21.9	10 44.7	+ 0 23.1	-0.8945	0.5489	0.2166	-12	-88	
80 Virginis	5.6	1.22	5.3	- 4 55.4	26 13 4.5	+ 1 50.1	+0.8188	0.5587	0.2170	+85	+ 8	
Piazz xiii, 174	6.4	1.23	5.0	5 1.9	16 51.7	+ 5 29.6	+0.1077	0.5604	0.2158	+43	-32	
* Virginis	6.5	1.24	5.0	6 22.5	18 49.7	+ 7 23.5	+1.0441	0.5613	0.2152	+84	+23	
Lalande 26147	6.5	+1.28	-4.3	- 7 6.5	27 7 59.2	- 3 54.5	-1.0038	0.5678	-0.2079	-22	-90	
ζ <sup>1</sup> Libræ	5.7	1.32	3.2	11 31.2	23 39.9	+11 12.5	+0.2708	0.5763	0.1938	+49	-23	
ζ <sup>2</sup> Libræ	5.7	1.31	3.2	11 2.1	28 0 41.0	-11 48.5	-0.4108	0.5768	0.1927	+12	-63	
17 Libræ	6.4	1.31	3.2	10 46.9	1 18.2	-11 12.7	-0.7836	0.5772	0.1920	-10	-90	
18 Libræ	5.9	1.31	3.1	10 46.3	1 35.6	-10 55.9	-0.8498	0.5774	0.1917	-14	-90	
γ Libræ	4.1	+1.31	-1.8	-14 28.8	16 50.5	+ 3 45.1	+0.0793	0.5857	-0.1715	+35	-33	
Bradley 1987	6.5	1.31	1.6	14 44.7	20 4.7	+ 6 51.9	-0.2031	0.5874	0.1665	+20	-49	
η Libræ	5.5	1.31	1.5	15 22.6	20 20.4	+ 7 6.9	+0.3826	0.5876	0.1661	+53	-16	
θ Libræ	4.4	1.31	1.0	16 27.4	29 0 17.7	+10 55.2	+0.8139	0.5896	0.1596	+74	+ 9	
B.D.-14°, 4314	6.2	1.28	1.2	14 33.5	1 25.7	-11 59.4	-1.2574	0.5903	0.1577	-53	-90	
49 Libræ	5.4	+1.28	-0.9	-16 15.6	2 57.7	-10 30.9	+0.1976	0.5910	-0.1550	+40	-27	

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## APRIL.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle. H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
$\chi$ Ophiuchi	4.9	+1.26	+0.3	-18 14.7	29 13 36.0	- 0 17.4	+0.6270	0.5960	-0.1352	+67	- 2
24 Scorpii	5.0	1.22	0.6	17 33.7	19 21.9	+ 5 14.9	-0.7985	0.5985	0.1235	-18	-90
B. A. C. 5700	6.1	1.18	1.4	19 23.6	30 1 24.9	+11 3.5	+0.3133	0.6007	0.1105	+43	-20
B. A. C. 5712	6.5	1.16	1.2	18 6.2	2 28.7	-11 55.2	-1.0848	0.6010	0.1082	-40	-90
29 Ophiuchi	6.4	1.16	1.5	18 44.9	3 17.7	-11 8.2	-0.5311	0.6013	0.1064	- 4	-74
B. A. C. 5746	6.2	+1.17	+1.8	-20 21.8	4 24.0	-10 4.6	+0.9591	0.6017	-0.1039	+70	+20
$\xi$ Ophiuchi	4.4	1.13	2.3	21 0.8	10 41.3	- 4 2.3	+0.9966	0.6035	0.0895	+69	+23
B. A. C. 5866	5.9	1.11	2.5	21 21.3	12 7.4	- 2 39.8	+1.2110	0.6038	0.0862	+69	+45
58 Ophiuchi	4.8	+1.04	+3.2	-21 38.3	19 20.8	+ 4 16.1	+0.9334	0.6051	-0.0688	+68	+18

## MAY.

B. A. C. 6081	6.4	+0.96	+3.2	-20 19.9	1 1 43.9	+10 23.6	-0.7575	0.6059	-0.0531	-22	-90
B. A. C. 6125	6.2	0.93	3.7	21 27.2	4 28.3	-10 58.7	+0.2240	0.6060	0.0463	+31	-25
$\mu$ Sagittarii	4.1	0.91	3.7	21 5.0	7 0.0	- 8 33.2	-0.2542	0.6060	0.0399	+ 5	-53
14 Sagittarii	5.6	+0.91	+3.9	-21 44.2	7 11.0	- 8 22.6	+0.3919	0.6060	-0.0395	+41	-15
15 Sagittarii	5.3	0.90	3.7	20 45.3	7 33.7	- 8 0.9	-0.6032	0.6060	0.0385	-15	-82
16 Sagittarii	5.9	0.90	3.6	20 24.9	7 34.1	- 8 0.5	-0.9430	0.6060	0.0385	-36	-90
21 Sagittarii	5.0	0.85	3.8	20 35.4	11 27.2	- 4 16.8	-0.8989	0.6058	0.0287	-34	-90
Bradley 2332	5.7	0.80	4.2	21 28.4	16 15.6	+ 0 19.8	-0.1253	0.6054	0.0166	+ 9	-45
B. A. C. 6347	5.9	+0.79	+4.1	-21 7.7	16 38.8	+ 0 42.0	-0.4778	0.6054	-0.0156	-10	-70
B.D.-21° 5131	6.3	0.76	4.3	21 5.7	19 6.7	+ 3 3.9	-0.5415	0.6050	0.0094	-13	-76
28 Sagittarii	5.6	0.75	4.7	22 29.3	19 29.2	+ 3 25.6	+0.8499	0.6050	0.0084	+68	+13
29 Sagittarii	5.3	0.74	4.1	20 25.8	20 48.0	+ 4 41.1	-1.2204	0.6047	0.0050	-62	-90
30 Sagittarii	6.2	0.74	4.7	22 16.1	21 13.4	+ 5 5.5	+0.6182	0.6047	0.0040	+56	- 2
31 Sagittarii	5.8	+0.72	+4.5	-21 28.4	22 27.1	+ 6 16.2	-0.1808	0.6044	-0.0009	+ 5	-49
$\nu$ Sagittarii	5.0	0.72	4.9	22 51.5	22 29.7	+ 6 18.7	+1.2073	0.6044	-0.0008	+67	+46
$\nu^s$ Sagittarii	5.1	0.72	4.9	22 47.2	22 51.5	+ 6 39.7	+1.1353	0.6043	+0.0001	+67	+37
$\xi^s$ Sagittarii	5.1	0.70	4.3	20 46.6	23 45.0	+ 7 31.0	-0.8771	0.6042	0.0024	-34	-90
$\xi^s$ Sagittarii	3.7	0.70	4.4	21 13.7	23 53.5	+ 7 39.1	-0.4248	0.6041	0.0027	- 8	-66
B. A. C. 6485	6.3	+0.68	+5.0	-22 49.5	2 1 22.4	+ 9 4.4	+1.1834	0.6038	+0.0065	+67	+43
$\sigma$ Sagittarii	3.9	0.66	4.8	21 52.6	2 33.9	+10 13.0	+0.2419	0.6035	0.0095	+29	-24
$\pi$ Sagittarii	3.0	0.63	4.6	21 10.2	4 32.7	-11 53.0	-0.4430	0.6030	0.0144	- 8	-67
B. A. C. 6561	6.4	0.62	4.8	21 48.7	5 34.9	-10 53.3	+0.2167	0.6027	0.0170	+28	-25
Piazzi xix, 61	5.5	0.58	5.2	22 34.5	8 44.5	- 7 51.4	+1.0496	0.6017	0.0248	+67	+28
50 Sagittarii	5.5	+0.55	+5.0	-21 57.6	10 57.7	- 5 43.5	+0.4934	0.6010	+0.0303	+48	- 9
B. A. C. 6671	6.1	0.52	4.9	21 30.3	12 45.5	- 4 0.0	+0.0941	0.6004	0.0347	+23	-32
f Sagittarii	5.1	0.43	4.4	19 59.0	18 50.9	+ 1 50.9	-1.1828	0.5979	0.0493	-55	-90
$\sigma$ Capricorni	5.5	0.25	4.4	19 24.5	7 59.4	- 9 31.5	-0.9214	0.5915	0.0794	-31	-90
$\sigma$ Capricorni	5.6	0.19	4.1	18 53.4	12 14.3	- 5 26.5	-1.0909	0.5892	0.0886	-42	-90
$\nu$ Capricorni	5.3	+0.13	+3.9	-18 27.9	16 22.7	- 1 27.6	-1.1393	0.5867	+0.0973	-46	-90
B.D.-18° 5783	6.4	0.08	3.8	18 22.7	20 11.5	+ 2 12.5	-0.8434	0.5845	0.1050	-23	-90
19 Capricorni	5.7	0.05	3.7	18 16.5	22 26.9	+ 4 22.9	-0.7073	0.5831	0.1095	-14	-90
20 Capricorni	6.2	0.02	4.0	19 23.7	4 0 25.5	+ 6 17.0	+0.6548	0.5819	0.1133	+67	- 1
21 Capricorni	6.5	+0.02	3.5	17 53.6	0 58.1	+ 6 48.4	-0.8152	0.5815	0.1144	-20	-90
$\theta$ Capricorni	4.1	-0.01	+3.4	-17 36.1	3 5.3	+ 8 50.8	-0.8662	0.5802	+0.1184	-22	-90
B.D.-17° 6216	6.1	0.06	3.5	17 43.7	6 56.2	-11 26.9	-0.2679	0.5778	0.1254	+12	-54
30 Capricorni	5.4	0.08	3.5	18 22.4	8 7.8	-10 17.9	+0.5429	0.5770	0.1276	+60	- 7
31 Capricorni	6.3	0.08	3.3	17 51.1	8 15.8	-10 10.2	+0.0257	0.5769	0.1278	+28	-36
$\iota$ Capricorni	4.3	0.10	3.1	17 13.8	9 57.6	- 8 32.2	-0.3913	0.5758	0.1308	+ 6	-62
$\gamma$ Capricorni	3.7	-0.20	+2.8	-17 4.9	17 35.7	- 1 10.6	+0.5050	0.5709	+0.1436	+59	-10
$\delta$ Capricorni	5.8	0.21	2.0	15 10.5	19 19.3	+ 0 29.3	-1.2036	0.5698	0.1463	-47	-90
$\epsilon$ Capricorni	2.9	0.23	2.4	16 32.9	20 36.5	+ 1 43.7	+0.3976	0.5690	0.1483	+52	-16
$\iota$ Aquarii	4.4	0.33	1.3	14 19.2	5 9.3	+ 9 58.4	-0.5768	0.5636	0.1606	0	-77
39 Aquarii	6.2	0.36	1.4	14 39.1	7 49.0	-11 27.4	+0.1971	0.5619	0.1642	+42	-27
42 Aquarii	5.5	-0.38	+0.8	-13 17.7	9 47.0	- 9 33.5	-0.8798	0.5607	+0.1667	-18	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>		
		$\Delta\alpha$	$\Delta\delta$										
		<i>s</i>	<i>"</i>	<i>°</i>	<i>d</i>	<i>h</i>	<i>m</i>	<i>h</i>	<i>m</i>				
45 Aquarii	6.1	-0.39	+0.9	-13 46.2	5	10	46.1	-8 36.4	-0.2238	0.5600	+0.1680	+20 -51	
50 Aquarii	5.9	0.42	0.9	14 0.0	13	12	9	-6 14.7	+0.4296	0.5586	0.1710	+57 -14	
Bradley 2961	6.2	0.44	+0.6	13 23.5	15	44	3	-3 48.4	+0.2338	0.5571	0.1740	+45 -25	
70 Aquarii	6.1	0.53	-0.5	11 2.8	6	0	13.2	+4 23.2	-0.6861	0.5522	0.1831	-4 -80	
74 Aquarii	5.8	0.56	0.3	12 6.7	2	31	0	+6 36.4	+0.8453	0.5510	0.1854	+78 +10	
$\psi^4$ Aquarii	4.5	-0.64	-1.6	-9 35.7	13	1	3	-7 14.0	+0.2175	0.5456	+0.1943	+47 -26	
$\chi$ Aquarii	5.3	0.65	2.0	8 14.1	13	29	9	-6 46.3	-1.1128	0.5453	0.1947	-31 -90	
$\psi^2$ Aquarii	4.6	0.66	1.6	9 41.4	13	59	5	-6 17.7	+0.5069	0.5451	0.1951	+66 -10	
$\psi^3$ Aquarii	5.2	0.67	1.5	10 7.2	14	29	5	-5 48.6	+1.0535	0.5448	0.1954	+80 +24	
B. A. C. 8214	6.5	0.73	2.5	7 58.8	22	25	3	+1 51.9	+0.3843	0.5412	0.2007	+59 -17	
Mayer 1012	6.3	-0.78	-3.1	-6 53.9	7	4	42.8	+7 57.4	+0.5213	0.5387	+0.2040	+69 -9	
B. A. C. 81	6.3	0.90	4.9	2 44.1	22	23	2	+1 4.8	-0.2106	0.5330	0.2098	+26 -50	
14 Ceti	5.4	0.92	5.5	-1 1.1	8	3	52.7	+6 24.0	-0.8792	0.5317	0.2105	-11 -90	
26 Ceti	6.0	1.00	6.3	+0 52.0	18	3	8	-3 50.6	+0.0993	0.5291	0.2102	+43 -32	
33 Ceti	6.1	1.02	6.6	1 56.9	21	28	1	-0 32.7	-0.3427	0.5288	0.2097	+19 -58	
<i>f</i> Piscium	5.1	-1.04	-6.9	+3 7.4	9	1	7.4	+3 0.0	-0.8344	0.5285	+0.2088	-8 -87	
Lalande 2632	6.5	1.06	7.0	3 3.1	5	43	4	+7 27.6	+0.2003	0.5282	0.2076	+49 -26	
$\nu$ Piscium	4.6	1.10	7.5	5 0.9	13	4	9	-9 24.2	-0.3907	0.5279	0.2049	+17 -61	
NEW MOON.													
Mayer 198	6.3	-1.18	-6.4	+19 40.6	13	18	8.5	-7 27.3	-0.1972	0.5428	+0.0942	+26 -35	
<i>m</i> Tauri	5.0	1.16	6.5	18 31.1	19	3	3	-6 34.3	+1.1686	0.5429	0.0926	+90 +48	
<i>l</i> Tauri	5.2	1.18	6.3	20 17.7	19	13	3	-6 24.6	-0.7786	0.5430	0.0924	-7 -70	
107 Tauri	6.5	1.18	6.3	19 44.3	19	43	5	-5 55.4	-0.1172	0.5430	0.0915	+31 -30	
B. A. C. 1639	6.2	1.16	6.1	20 2.2	14	0	41.9	-1 6.5	-0.0126	0.5438	0.0831	+37 -24	
B. A. C. 1651	6.5	-1.16	-6.1	+19 43.1	1	30	9	-0 19.1	+0.4053	0.5439	+0.0817	+64 -1	
Piazzi v, 125	6.1	1.13	5.7	20 24.4	7	33	4	+5 31.7	+0.1057	0.5447	0.0712	+44 -16	
$\zeta$ Tauri	3.0	1.12	5.5	21 5.1	9	26	7	+7 21.4	-0.5136	0.5449	0.0679	+9 -53	
$\chi^1$ Orionis	4.5	1.08	5.3	20 15.5	17	25	0	-8 55.8	+0.8872	0.5457	0.0536	+90 +30	
$\chi^4$ Orionis	4.7	1.05	5.1	20 8.4	21	55	5	-4 34.1	+1.2419	0.5461	0.0454	+90 +62	
B. A. C. 1970	6.0	-1.04	-4.5	+22 12.2	15	0	32.7	-2 2.0	-0.9351	0.5462	+0.0406	-19 -68	
$\eta$ Geminorum	3.5	1.03	4.3	22 32.0	3	3	9	+0 24.3	-1.2037	0.5464	0.0360	-45 -67	
$\mu$ Geminorum	3.2	1.00	4.1	22 33.6	6	52	5	+4 5.4	-1.1109	0.5465	0.0290	-34 -67	
15 Geminorum	6.5	0.98	4.3	20 50.7	9	11	3	+6 19.7	+0.8542	0.5466	0.0246	+90 +31	
16 Geminorum	6.2	0.97	4.3	20 33.1	9	16	4	+6 24.6	+1.1830	0.5466	0.0245	+90 +57	
$\delta$ Geminorum	5.2	-0.90	-3.6	+21 52.2	20	23	2	-6 50.4	-0.1238	0.5466	+0.0037	+30 -23	
NEPTUNE				22 11.4	20	26	7	-6 46.9	-0.4780	0.5453	+0.0037	+10 -45	
$\zeta$ Geminorum	4.0	0.84	3.6	20 42.4	16	2	20.1	-1 5.1	+1.1570	0.5464	-0.0074	+90 +55	
44 Geminorum	5.9	0.85	3.0	22 46.6	2	51	6	-0 34.6	-1.1441	0.5463	0.0084	-38 -67	
Lalande 13849	6.5	0.82	3.4	21 24.5	5	9	9	+1 39.1	+0.3492	0.5462	0.0127	+60 +3	
$\delta$ Geminorum	3.5	-0.78	-2.8	+22 9.2	9	52	4	+6 12.4	-0.5571	0.5459	-0.0214	+6 -53	
56 Geminorum	5.2	0.76	3.2	20 37.1	10	45	9	+7 4.3	+1.1248	0.5458	0.0231	+90 +51	
B. A. C. 2455	6.4	0.76	2.8	21 43.3	13	4	3	+9 18.1	-0.1558	0.5456	0.0273	+29 -26	
61 Geminorum	5.8	0.74	3.2	20 26.6	13	7	5	+9 21.3	+1.2600	0.5456	0.0274	+90 +66	
63 Geminorum	5.3	0.74	2.8	21 38.1	13	29	2	+9 42.2	-0.0720	0.5456	0.0281	+33 -22	
79 Geminorum	6.3	-0.66	-2.7	+20 32.3	21	45	2	-6 17.9	+0.8471	0.5448	-0.0433	+90 +28	
85 Geminorum	5.2	0.61	2.7	20 7.8	17	2	45.0	-1 27.7	+1.0610	0.5442	0.0524	+90 +43	
B. D. +20°, 1976	6.3	0.58	2.6	20 4.3	5	11	5	+0 54.0	+0.9920	0.5438	0.0567	+90 +37	
$\mu^2$ Cancri	5.5	0.56	1.8	21 51.1	8	28	6	+4 4.7	-1.1735	0.5434	0.0626	-40 -68	
Piazzi viii, 42	6.0	0.50	1.8	21 2.5	14	29	6	+9 54.1	-0.6851	0.5425	0.0732	-2 -67	
$\eta$ Cancri	5.4	-0.43	-1.8	+20 45.4	20	25	2	-8 21.7	-0.8346	0.5416	-0.0834	-11 -69	
39 Cancri	6.5	0.39	1.7	20 20.2	23	58	6	-4 55.3	-0.6770	0.5410	0.0894	-1 -67	
40 Cancri	6.5	0.39	1.7	20 18.0	18	0	1.0	-4 52.9	-0.6407	0.5410	0.0895	+1 -65	
B. A. C. 2919	6.5	0.39	1.8	19 59.9	0	6	4	-4 47.7	-0.3170	0.5410	0.0896	+20 -42	
$\epsilon$ Cancri	6.3	0.38	1.8	19 52.4	0	8	9	-4 45.3	-0.1830	0.5410	0.0897	+27 -34	
$\delta$ Cancri	4.1	-0.35	-2.2	+18 29.8	2	12	2	-2 45.9	+1.1467	0.5407	-0.0931	+90 +46	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.											
MAY.											
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
B. A. C. 2991	6.1	-0.33	-1.8	+19 10.8	18 5 6.8	+ 0 3.0	+0.1160	0.5402	-0.0979	+45	-19
B. A. C. 3209	6.3	0.13	2.0	16 59.2	21 59.0	- 7 36.9	+0.6405	0.5375	0.1244	+85	+ 7
8 Leonis	5.9	-0.07	1.8	16 51.3	19 3 34.9	- 2 11.5	+0.0644	0.5368	0.1327	+41	-25
B.D.+16°, 2077	6.3	+0.09	1.5	16 12.6	17 36.4	+11 23.6	-1.2299	0.5350	0.1521	-43	-74
34 Leonis	6.4	0.14	2.3	13 48.8	20 32.7	- 9 45.6	+0.9157	0.5346	0.1559	+90	+21
37 Leonis	5.5	+0.16	-2.1	+14 11.5	23 1.3	- 7 21.7	+0.1159	0.5344	-0.1590	+44	-25
7 Leonis	5.3	0.35	2.7	11 2.2	20 15 5.2	+ 8 12.1	+0.8032	0.5337	0.1777	+90	+10
Piazz xi, 12	5.8	0.49	3.2	8 34.1	21 3 18.3	- 3 57.6	+1.1872	0.5339	0.1899	+90	+38
$\omega$ Virginis	5.4	0.61	2.8	8 38.9	15 19.1	+ 7 40.7	-1.2409	0.5351	0.2000	-41	-81
$\nu$ Virginis	4.2	0.67	3.2	7 3.0	18 56.9	+11 11.7	-0.2815	0.5356	0.2027	+22	-52
b Virginis	5.2	+0.74	-3.9	+ 4 10.3	22 1 49.9	- 6 8.3	+1.3342	0.5370	-0.2072	+90	+55
B.D.+6°, 2543	6.5	0.75	3.2	6 4.6	3 41.1	- 4 20.6	-1.0506	0.5374	0.2083	-23	-84
c Virginis	5.1	0.84	3.6	3 49.8	11 44.7	+ 3 27.7	-0.3917	0.5394	0.2125	+17	-61
Piazz xii, 142	5.9	0.93	3.7	+ 2 21.9	20 23.8	+11 50.3	-0.7193	0.5421	0.2158	- 1	-87
80 Virginis	5.6	1.21	4.3	- 4 55.4	23 23 9.6	-10 16.7	+0.9451	0.5540	0.2174	+85	+16
Piazz xiii, 174	6.4	+1.24	-4.1	- 5 1.9	24 2 59.5	- 6 34.5	+0.2223	0.5561	-0.2165	+50	-26
n Virginis	6.5	1.26	4.3	6 22.5	4 58.7	- 4 39.4	+1.1505	0.5572	0.2158	+84	+32
Lalande 26147	6.5	1.37	3.7	7 6.4	18 14.3	- 8 8.8	-0.9272	0.5653	0.2094	-16	-90
$\xi^1$ Libræ	5.7	1.50	3.1	11 31.2	25 9 56.7	+ 0 42.6	+0.3076	0.5760	0.1962	+52	-21
$\xi^2$ Libræ	5.7	1.50	3.0	11 2.1	10 57.6	+ 0 16.2	-0.3749	0.5767	0.1951	+14	-61
17 Libræ	6.4	+1.50	-2.9	-10 46.9	11 34.8	+ 0 52.0	-0.7482	0.5771	-0.1945	- 7	-90
18 Libræ	5.9	1.50	2.9	10 46.3	11 52.0	+ 1 8.5	-0.8149	0.5773	0.1941	-11	-90
$\gamma$ Libræ	4.1	1.61	1.9	14 28.8	26 3 1.4	- 8 15.9	+0.0735	0.5880	0.1746	+35	-33
Bradley 1987	6.5	1.62	1.7	14 44.7	6 13.6	- 5 11.1	-0.2149	0.5902	0.1697	+19	-50
$\eta$ Libræ	5.5	1.63	1.7	15 22.6	6 29.2	- 4 56.1	+0.3665	0.5904	0.1693	+52	-18
$\theta$ Libræ	4.4	+1.65	-1.3	-16 27.4	10 23.6	- 1 10.8	+0.7850	0.5931	-0.1630	+74	+ 7
B.D.-14°, 4314	6.2	1.63	1.1	14 33.5	11 30.7	- 0 6.2	-1.2742	0.5938	0.1611	-55	-90
49 Libræ	5.4	1.64	-1.2	16 15.6	13 1.5	+ 1 21.0	+0.1666	0.5948	0.1585	+39	-28
$\chi$ Ophiuchi	4.9	1.69	0.0	18 14.7	23 29.4	+11 24.1	+0.5671	0.6014	0.1388	+62	- 6
24 Scorpii	5.0	1.68	+0.6	17 33.7	27 5 8.4	- 7 10.6	-0.8571	0.6047	0.1271	-22	-90
Bradley 2115	5.5	+1.71	+0.7	-19 44.8	5 13.9	- 7 5.3	+1.2810	0.6047	-0.1269	+70	+57
Mayer 679	5.9	1.71	1.1	20 15.6	9 39.2	- 2 50.8	+1.2458	0.6071	0.1172	+70	+49
B. A. C. 5700	6.1	1.70	1.3	19 23.6	11 3.5	- 1 29.9	+0.2300	0.6077	0.1141	+38	-25
B. A. C. 5712	6.5	1.68	1.3	18 6.2	12 5.8	- 0 30.1	-1.1546	0.6082	0.1117	-46	-90
29 Ophiuchi	6.4	1.69	1.4	18 44.9	12 53.7	+ 0 15.8	-0.6088	0.6086	0.1099	- 8	-82
B. A. C. 5746	6.2	+1.70	+1.6	-20 21.8	13 58.4	+ 1 17.8	+0.8620	0.6091	-0.1074	+70	+13
$\xi$ Ophiuchi	4.4	1.70	2.3	21 0.8	20 6.2	+ 7 10.4	+0.8855	0.6116	0.0928	+69	+14
B. A. C. 5866	5.9	1.69	2.5	21 21.3	21 30.0	+ 8 30.7	+1.0942	0.6121	0.0894	+69	+31
58 Ophiuchi	4.8	1.67	3.3	21 38.3	4 31.4	- 8 45.4	+0.8054	0.6142	0.0718	+68	+ 9
B. A. C. 6081	6.4	1.62	3.8	20 19.9	10 43.2	- 2 49.1	-0.8741	0.6155	0.0559	-29	-90
B. A. C. 6125	6.2	+1.62	+4.2	-21 27.2	13 22.6	- 0 16.4	+0.0887	0.6158	-0.0489	+24	-32
$\mu$ Sagittarii	4.1	1.60	4.4	21 4.9	15 49.5	+ 2 4.3	-0.3872	0.6161	0.0424	- 2	-63
14 Sagittarii	5.6	1.60	4.5	21 44.2	16 0.2	+ 2 14.5	+0.2494	0.6161	0.0420	+33	-24
15 Sagittarii	5.3	1.59	4.4	20 45.3	16 22.2	+ 2 35.6	-0.7321	0.6162	0.0410	-22	-90
16 Sagittarii	5.9	1.58	4.4	20 24.9	16 22.6	+ 2 36.0	-1.0670	0.6162	0.0410	-45	-90
21 Sagittarii	5.0	+1.56	+4.7	-20 35.4	20 8.2	+ 6 12.1	-1.0299	0.6163	-0.0309	-43	-90
Bradley 2332	5.7	1.53	5.3	21 28.4	29 0 47.2	+10 39.2	-0.2755	0.6160	0.0185	+ 3	-55
B. A. C. 6347	5.9	1.52	5.2	21 7.7	1 9.7	+11 0.8	-0.6233	0.6160	0.0175	-18	-85
B.D.-21°, 5131	6.3	1.50	5.5	21 5.7	3 32.6	-10 42.3	-0.6899	0.6157	0.0111	-22	-90
28 Sagittarii	5.6	1.51	5.8	22 29.3	3 54.4	-10 21.5	+0.6799	0.6157	0.0101	+62	+ 2
30 Sagittarii	6.2	+1.49	+5.8	-22 16.0	5 35.1	- 8 45.0	+0.4490	0.6154	-0.0056	+42	-12
33 Sagittarii	5.8	1.48	5.8	21 28.3	6 46.4	- 7 36.7	-0.3398	0.6152	0.0024	- 4	-59
$\nu^1$ Sagittarii	5.0	1.49	6.1	22 51.5	6 48.9	- 7 34.3	+1.0272	0.6152	0.0023	+68	+26
$\nu^2$ Sagittarii	5.1	1.49	6.1	22 47.2	7 9.9	- 7 14.1	+0.9557	0.6151	-0.0014	+67	+20
$\xi^1$ Sagittarii	5.1	1.46	5.8	20 46.6	8 1.7	- 6 24.5	-1.0274	0.6150	+0.0009	-45	-90
$\xi^2$ Sagittarii	3.7	+1.46	+5.9	-21 13.7	8 9.9	- 6 16.7	-0.5822	0.6150	+0.0013	-17	-80

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		s	"	° ' "	d h m	h m				° ' "	° ' "		
B. A. C. 6485	6.3	+1.46	+6.3	-22 49.5	29 9 35.8	- 4 54.3	+0.9991	0.6146	+0.0051	+67	+24		
o Sagittarii	3.9	1.44	6.2	21 52.6	10 44.9	- 3 48.1	+0.0703	0.6144	0.0082	+19	-34		
$\pi$ Sagittarii	3.0	1.42	6.2	21 10.2	12 39.6	- 1 58.3	-0.6070	0.6139	0.0133	-17	-83		
B. A. C. 6561	6.4	1.41	6.4	21 48.7	13 39.7	- 1 0.7	+0.0412	0.6136	0.0159	+18	-35		
Piazzixix, 61	5.5	1.38	6.8	22 34.4	16 42.9	+ 1 54.8	+0.8568	0.6127	0.0239	+68	+13		
50 Sagittarii	5.5	+1.36	+6.8	-21 57.6	18 51.5	+ 3 58.1	+0.3061	0.6119	+0.0206	+35	-20		
B. A. C. 6671	6.1	1.34	6.8	21 30.2	20 35.6	+ 5 37.9	-0.0395	0.6112	0.0341	+13	-43		
$\sigma$ Capricorni	5.5	1.10	7.2	19 24.4	30 15 10.6	- 0 32.7	-1.1125	0.6016	0.0799	-45	-90		
o Capricorni	5.6	1.05	7.2	18 53.4	19 17.3	+ 3 24.1	-1.2840	0.5990	0.0893	-67	-90		
B.D.-18°, 5783	6.4	0.95	7.3	18 22.6	31 2 59.4	+10 48.0	-1.0480	0.5937	0.1061	-37	-90		
19 Capricorni	5.7	+0.92	+7.3	-18 16.4	5 10.7	-11 5.9	-0.9157	0.5921	+0.1106	-27	-90		
20 Capricorni	6.2	0.89	7.7	19 23.6	7 5.7	- 9 15.2	+0.4259	0.5906	0.1145	+51	-14		
21 Capricorni	6.5	0.88	7.2	17 53.5	7 37.4	- 8 44.7	-1.0243	0.5903	0.1156	-36	-90		
$\theta$ Capricorni	4.1	0.86	7.1	17 36.1	9 40.8	- 6 46.1	-1.0763	0.5887	0.1197	-38	-90		
B.D.-17°, 6216	6.1	0.81	7.2	17 43.7	13 25.2	- 3 10.3	-0.4888	0.5859	0.1268	0	-70		
30 Capricorni	5.4	+0.79	+7.5	-18 22.4	14 34.8	- 2 3.4	+0.3105	0.5850	+0.1290	+44	-20		
31 Capricorni	6.3	0.79	7.3	17 51.0	14 42.6	- 1 55.9	-1.1999	0.5849	0.1292	+16	-50		
i Capricorni	4.3	0.77	7.1	17 13.7	16 21.5	- 0 20.7	-0.6126	0.5837	0.1323	- 6	-82		
$\gamma$ Capricorni	3.7	0.67	7.1	17 4.8	23 47.6	+ 6 48.7	+0.2684	0.5779	0.1451	+44	-23		

JUNE.

d Capricorni	2.9	+0.64	+6.8	-16 32.9	1 2 43.9	+ 9 38.5	+0.1612	0.5756	+0.1499	+38	-29
B.D.-17°, 6389	6.5	0.61	7.1	17 16.6	4 5.1	+10 56.8	+1.1076	0.5745	0.1520	+73	+30
i Aquarii	4.4	0.52	6.1	14 19.2	11 5.0	- 6 18.5	-0.8054	0.5691	0.1623	-14	-90
39 Aquarii	6.2	+0.49	+6.1	-14 39.0	13 41.4	- 3 47.7	-0.0401	0.5671	+0.1659	+29	-40
42 Aquarii	5.5	0.47	5.7	13 17.6	15 37.0	- 1 56.1	-1.1063	0.5657	0.1684	-34	-90
45 Aquarii	6.1	0.45	5.8	13 46.1	16 34.9	- 1 0.3	-0.4572	0.5649	0.1696	+ 7	-67
50 Aquarii	5.9	0.42	5.9	14 0.0	18 59.0	+ 1 18.7	+0.1895	0.5631	0.1726	+43	-27
Bradley 2961	6.2	0.40	5.6	13 23.4	21 27.5	+ 3 42.0	-0.0044	0.5613	0.1756	+32	-38
70 Aquarii	6.1	+0.28	+4.5	-11 2.7	2 5 48.3	+11 45.8	-0.9160	0.5554	+0.1847	-19	-90
74 Aquarii	5.8	0.26	4.9	12 6.6	8 4.2	-10 3.0	+0.6038	0.5538	0.1868	+72	- 5
$\psi^1$ Aquarii	4.5	0.16	3.7	9 35.6	18 27.0	- 0 0.9	-0.0156	0.5472	0.1956	+34	-39
$\chi$ Aquarii	5.3	0.14	3.2	8 14.0	18 55.3	+ 0 26.5	-1.3376	0.5469	0.1960	-60	-90
$\psi^2$ Aquarii	4.6	0.13	3.7	9 41.4	19 24.6	+ 0 54.8	+0.2724	0.5464	0.1963	+51	-23
$\psi^3$ Aquarii	5.2	+0.13	+3.8	-10 7.1	19 54.3	+ 1 23.6	+0.8161	0.5463	+0.1967	+80	+ 8
B. A. C. 8214	6.5	+0.05	2.6	7 58.7	3 46.5	+ 9 0.4	+0.1556	0.5419	0.2017	+45	-29
Mayer 1012	6.3	-0.02	2.2	6 53.8	10 2.0	- 8 56.2	+0.2967	0.5387	0.2049	+54	-22
30 Piscium	4.7	0.09	1.8	6 31.8	16 33.7	- 2 36.8	+1.2619	0.5356	0.2075	+83	+43
33 Piscium	4.7	0.10	1.7	6 13.6	18 13.1	- 1 0.5	+1.2884	0.5349	0.2081	+84	+46
Piazzio i	6.0	-0.13	+1.4	- 5 45.9	20 39.8	+ 1 21.6	+1.3123	0.5339	+0.2088	+84	+50
B. A. C. 81	6.3	0.18	+0.1	- 2 44.0	4 3 41.0	+ 8 9.9	-0.4164	0.5313	0.2103	+15	-63
14 Ceti	5.4	0.22	-0.6	- 1 1.0	9 11.2	-10 30.1	-1.0782	0.5295	0.2110	-25	-90
26 Ceti	6.0	0.35	1.7	+ 0 52.1	23 26.3	+ 3 19.1	-0.0822	0.5261	0.2104	+33	-42
33 Ceti	6.1	0.38	2.1	1 57.0	5 2 51.9	+ 6 38.5	-0.5196	0.5255	0.2099	+10	-71
f Piscium	5.1	-0.41	-2.6	+ 3 7.5	6 32.9	+10 12.9	-1.0064	0.5250	+0.2091	-20	-87
Lalande 2632	6.5	0.45	2.7	3 3.1	11 11.1	- 9 17.3	+0.0364	0.5245	0.2078	+40	-35
v Piscium	4.6	0.50	3.3	5 1.0	18 36.6	- 2 5.0	-0.5438	0.5241	0.2051	+ 9	-72
Piazzii i, 249	6.5	0.59	4.3	7 17.3	6 35.0	+ 9 32.0	-0.5783	0.5240	0.1991	+ 7	-74
64 Ceti	5.8	0.61	4.6	8 8.0	9 54.8	-11 14.2	-0.8344	0.5242	0.1971	- 9	-82
$\xi^1$ Ceti	4.5	-0.61	-4.7	+ 8 24.6	10 44.9	-10 25.6	-0.9695	0.5243	+0.1966	-17	-82
25 Arietis	6.5	0.67	5.2	9 47.1	18 6.4	- 3 17.2	-1.0362	0.5250	0.1915	-23	-80
$\xi^2$ Ceti	4.5	0.67	4.7	8 2.5	18 30.0	- 2 54.4	+0.9330	0.5250	0.1913	+90	+17
B. F. 310	6.3	0.67	5.0	9 9.0	19 13.3	- 2 12.3	-0.1330	0.5251	0.1907	+30	-43
85 Ceti	6.3	0.71	5.3	10 20.6	7 1 47.0	+ 4 9.6	-0.1992	0.5260	0.1855	+27	-46
$\mu$ Ceti	4.3	-0.72	-5.2	+ 9 43.2	3 1.6	+ 5 22.0	+0.7106	0.5262	+0.1845	+90	+ 4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.												
JUNE.												
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting		
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle.	$Y'$	$x'$	$y'$	N.	S.	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m						
W. B. ii, 1033	5.8	-0.78	-5.9	+12 49.7	7 13 53.0	- 8 6.2	-0.7328	0.5281	+0.1744	- 3	-77	
Mayer 121	6.4	0.86	6.2	15 7.4	8 5 37.7	+ 7 9.7	-0.6375	0.5316	+0.1572	+ 2	-71	
NEW MOON.												
44 Geminorum	5.9	0.93	3.0	22 46.6	12 9 17.0	+ 7 38.3	-1.0287	0.5477	-0.0071	-26	-67	
Lalande 13849	6.5	-0.91	-3.3	+21 24.5	11 35.2	+ 9 52.0	+0.4707	0.5476	-0.0114	+70	+10	
JUPITER				22 46.3	12 30.1	+10 45.2	-1.0567	0.5377	0.0121	-29	-67	
$\delta$ Geminorum	3.5	0.90	2.9	22 9.2	16 17.3	- 9 35.1	-0.4317	0.5472	0.0203	+13	-43	
56 Geminorum	5.2	0.88	2.9	20 37.1	17 10.8	- 8 43.3	+1.2550	0.5471	0.0220	+90	+66	
B. A. C. 2455	6.4	0.88	2.6	21 43.3	19 29.0	- 6 29.6	-0.0257	0.5469	0.0262	+36	-19	
63 Geminorum	5.3	-0.87	-2.7	+21 38.1	19 53.9	- 6 5.5	+0.0587	0.5469	-0.0270	+41	-14	
79 Geminorum	6.3	0.81	2.4	20 32.3	13 4 9.6	+ 1 54.0	+0.9899	0.5459	0.0423	+90	+38	
85 Geminorum	5.2	0.78	2.2	20 7.8	9 9.4	+ 6 44.1	+1.2102	0.5452	0.0514	+90	+57	
B.D.+20°, 1976	6.3	0.75	2.2	20 4.3	11 35.9	+ 9 5.8	+1.1437	0.5448	0.0558	+90	+49	
$\mu^a$ Cancri	5.5	0.75	1.6	21 51.1	14 53.1	-11 43.4	-1.0252	0.5443	0.0617	-26	-68	
Piazzii viii, 42	6.0	-0.70	-1.4	+21 2.5	20 54.6	- 5 53.5	-0.5295	0.5431	-0.0723	+ 8	-54	
$\eta$ Cancri	5.4	0.65	1.1	20 45.4	14 2 50.9	- 0 8.5	-0.6744	0.5419	0.0826	- 1	-66	
39 Cancri	6.5	0.62	1.1	20 20.2	6 24.8	+ 3 18.6	-0.5132	0.5412	0.0886	+ 9	-55	
40 Cancri	6.5	0.62	1.1	20 18.0	6 27.3	+ 3 21.0	-0.4766	0.5412	0.0887	+11	-52	
B. A. C. 2919	6.5	0.62	1.1	19 59.9	6 32.6	+ 3 26.1	-0.1515	0.5412	0.0888	+29	-32	
$\epsilon$ Cancri	6.3	-0.62	-1.2	+19 52.4	6 35.2	+ 3 28.6	-0.0168	0.5412	-0.0889	+37	-24	
B. A. C. 2991	6.1	0.57	1.1	19 10.8	11 34.1	+ 8 17.9	+0.2878	0.5400	0.0971	+55	- 9	
B. A. C. 3209	6.3	0.41	0.8	16 59.2	15 4 32.2	+ 0 43.8	+0.8278	0.5362	0.1236	+90	+18	
8 Leonis	5.9	0.35	0.6	16 51.3	10 10.9	+ 6 12.0	+0.2517	0.5349	0.1318	+53	-14	
B.D.+16°, 2077	6.3	0.21	0.1	16 12.6	16 0 21.6	- 4 3.6	-1.0463	0.5320	0.1509	-25	-74	
34 Leonis	6.4	-0.16	-0.8	+13 48.9	3 20.3	- 1 10.5	+1.1177	0.5314	-0.1547	+90	+35	
37 Leonis	5.5	-0.14	0.6	14 11.5	5 51.0	+ 1 15.6	+0.3120	0.5310	0.1578	+56	-14	
$\gamma$ Leonis	5.3	+0.04	1.0	11 2.2	22 10.8	- 6 54.7	+1.0092	0.5287	0.1761	+90	+24	
$\omega$ Virginis	5.4	0.32	0.8	8 38.9	17 22 56.6	- 6 54.1	-1.0615	0.5282	0.1977	-24	-81	
$\nu$ Virginis	4.2	0.37	1.4	7 3.0	18 2 39.9	- 3 17.7	-0.0920	0.5285	0.2003	+33	-41	
B.D.+6°, 2543	6.5	+0.47	-1.2	+ 6 4.6	11 38.0	+ 5 24.0	-0.8754	0.5295	-0.2058	-11	-84	
$\epsilon$ Virginis	5.1	0.57	1.7	3 49.8	19 55.1	-10 34.1	-0.2134	0.5311	0.2099	+26	-50	
Piazzii xii, 142	5.9	0.68	1.8	+ 2 22.0	19 4 49.4	- 1 56.3	-0.5521	0.5334	0.2131	+ 8	-73	
80 Virginis	5.6	1.05	2.8	- 4 55.4	20 8 23.1	+ 0 44.8	+1.1048	0.5449	0.2149	+85	+27	
Piazzii xiii, 174	6.4	1.08	2.7	5 1.9	12 19.6	+ 4 33.5	+0.3681	0.5471	0.2141	+59	-18	
$n$ Virginis	6.5	+1.11	-3.0	- 6 22.5	14 22.3	+ 6 32.2	+1.3109	0.5483	-0.2135	+84	+50	
Lalande 26147	6.5	1.27	2.4	7 6.4	21 3 59.9	- 4 17.5	-0.8157	0.5569	0.2076	- 9	-90	
$\xi^1$ Libræ	5.7	1.48	2.4	11 31.2	20 5.2	+11 14.1	+0.4077	0.5687	0.1952	+58	-16	
$\xi^2$ Libræ	5.7	1.48	2.1	11 2.1	21 7.5	-11 45.7	-0.2822	0.5695	0.1941	+19	-54	
17 Libræ	6.4	1.49	2.0	10 46.9	21 45.5	-11 9.1	-0.6597	0.5700	0.1935	- 2	-85	
18 Libræ	5.9	+1.49	-2.0	-10 46.3	22 3.1	-10 52.2	-0.7274	0.5702	-0.1932	- 6	-90	
$\gamma$ Libræ	4.1	1.68	1.5	14 28.8	22 13 29.4	+ 4 0.1	+0.1436	0.5826	0.1746	+39	-30	
Bradley 1987	6.5	1.70	1.3	14 44.7	16 44.5	+ 7 7.9	-0.1517	0.5852	0.1698	+23	-46	
$\eta$ Libræ	5.5	1.71	1.4	15 22.6	17 0.3	+ 7 23.1	+0.4324	0.5854	0.1695	+56	-14	
$\theta$ Libræ	4.4	1.76	1.0	16 27.4	20 57.8	+11 11.5	+0.8460	0.5886	0.1633	+74	+10	
B.D.-14°, 4314	6.2	+1.75	-0.6	-14 33.5	22 5.8	-11 43.2	-1.2243	0.5895	-0.1615	-48	-90	
49 Libræ	5.4	1.76	-1.0	16 15.6	23 37.6	-10 14.7	+0.2204	0.5907	0.1589	+42	-25	
$\chi$ Ophiuchi	4.9	1.88	0.0	18 14.7	23 10 11.1	- 0 6.0	+0.6041	0.5990	0.1398	+65	- 4	
24 Scorpii	5.0	1.91	+0.8	17 33.7	15 51.9	+ 5 21.2	-0.8313	0.6031	0.1283	-20	-90	
Mayer 679	5.9	1.97	1.0	20 15.6	20 23.4	+ 9 41.6	-0.1260	0.6063	0.1186	+70	+53	
B. A. C. 5700	6.1	+1.97	+1.3	-19 23.6	21 47.8	+11 2.7	+0.2469	0.6071	-0.1155	+39	-24	
B. A. C. 5712	6.5	1.95	1.5	18 6.2	22 50.1	-11 57.6	-1.1386	0.6078	0.1132	-45	-90	
29 Ophiuchi	6.4	1.97	1.6	18 44.9	23 38.0	-11 11.6	-0.5943	0.6083	0.1114	- 7	-80	
B. A. C. 5746	6.2	1.99	1.6	20 21.8	24 0 42.6	-10 9.8	+0.8735	0.6090	0.1090	+70	+13	
$\xi$ Ophiuchi	4.4	2.04	2.2	21 0.8	6 49.6	- 4 18.0	+0.8862	0.6125	0.0945	+69	+14	
B. A. C. 5866	5.9	+2.04	+2.4	-21 21.3	8 13.2	- 2 57.9	+1.0919	0.6133	-0.0911	+69	+31	



## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		s	"	°	d h m	h m				°	°		
58 Ophiuchi	4.8	+2.06	+ 3.3	-21 38.3	24 15 11.9	+ 3 43.3	+0.7919	0.6166	-0.0737	+68	+ 8		
B. A. C. 6081	6.4	2.05	4.2	20 19.9	21 20.2	+ 9 36.0	-0.8892	0.6189	0.0576	-30	-90		
B. A. C. 6125	6.2	2.06	4.5	21 27.1	23 57.8	-11 53.1	+0.0647	0.6197	0.0507	+23	-33		
$\mu$ Sagittarii	4.1	2.06	4.8	21 4.9	25 2 22.9	- 9 34.2	-0.4118	0.6203	0.0442	- 4	-65		
14 Sagittarii	5.6	2.07	4.8	21 44.2	2 33.4	- 9 24.2	+0.2205	0.6203	0.0437	+31	-25		
15 Sagittarii	5.3	+2.06	+ 4.9	-20 45.3	2 55.1	- 9 3.4	-0.7553	0.6204	-0.0427	-23	-90		
16 Sagittarii	5.9	2.05	4.9	20 24.9	2 55.5	- 9 3.0	-1.0881	0.6204	0.0427	-46	-90		
21 Sagittarii	5.0	2.05	5.3	20 35.4	6 37.9	- 5 30.1	-1.0558	0.6211	0.0326	-45	-90		
Bradley 2332	5.7	2.05	5.9	21 28.4	11 12.4	- 1 7.5	-0.3131	0.6216	0.0201	0	-57		
B. A. C. 6347	5.9	2.05	5.9	21 7.6	11 34.5	- 0 46.3	-0.6586	0.6216	0.0190	-19	-90		
B.D.-21°, 5131	6.3	+2.04	+ 6.2	-21 5.7	13 54.9	+ 1 28.1	-0.7277	0.6218	-0.0126	-24	-90		
28 Sagittarii	5.6	2.06	6.3	22 29.3	14 16.3	+ 1 48.5	+0.6301	0.6218	0.0116	+57	- 2		
30 Sagittarii	6.2	2.05	6.5	22 16.0	15 55.1	+ 3 23.1	+0.3987	0.6218	0.0071	+39	-15		
33 Sagittarii	5.8	2.04	6.6	21 28.3	17 5.0	+ 4 30.0	-0.3847	0.6218	0.0038	- 6	-63		
$\nu^1$ Sagittarii	5.0	2.06	6.7	22 51.5	17 7.4	+ 4 32.3	+0.9699	0.6218	0.0037	+67	+21		
$\nu^2$ Sagittarii	5.1	+2.06	+ 6.8	-22 47.2	17 28.0	+ 4 52.1	+0.8985	0.6218	-0.0028	+67	+16		
$\xi^1$ Sagittarii	5.1	2.03	6.8	20 46.6	18 18.8	+ 5 40.7	-1.0676	0.6217	-0.0004	-48	-90		
$\xi^2$ Sagittarii	3.7	2.03	6.8	21 13.6	18 26.8	+ 5 48.3	-0.6267	0.6217	0.0000	-19	-85		
B. A. C. 6485	6.3	2.05	7.0	22 49.5	19 50.9	+ 7 8.8	+0.9380	0.6215	+0.0039	+67	+18		
$\sigma$ Sagittarii	3.9	2.03	7.1	21 52.6	20 58.5	+ 8 13.5	+0.0164	0.6214	0.0069	+16	-37		
$\pi$ Sagittarii	3.0	+2.01	+ 7.3	-21 10.2	22 50.8	+10 1.0	-0.6567	0.6212	+0.0121	-20	-89		
B. A. C. 6561	6.4	2.02	7.4	21 48.7	23 49.5	+10 57.2	-0.0163	0.6210	0.0148	+15	-39		
Piazzi xix, 61	5.5	2.01	7.8	22 34.4	26 2 48.5	-10 11.4	+0.7867	0.6205	0.0230	+67	+ 8		
50 Sagittarii	5.5	1.99	8.0	21 57.5	4 54.1	- 8 11.2	+0.2390	0.6200	0.0287	+31	-24		
B. A. C. 6671	6.1	1.98	8.1	21 30.2	6 35.6	- 6 34.0	-0.1543	0.6195	0.0333	+ 9	-47		
$\sigma$ Capricorni	5.5	+1.81	+ 9.7	-19 24.4	27 0 39.8	+10 44.4	-1.1852	0.6115	+0.0802	-53	-90		
B. D.-18°, 5783	6.4	1.71	10.1	18 22.6	12 6.5	- 2 17.0	-1.1324	0.6041	0.1071	-44	-90		
19 Capricorni	5.7	1.69	10.2	18 16.4	14 13.5	- 0 15.2	-1.0045	0.6026	0.1117	-33	-90		
20 Capricorni	6.2	1.68	10.6	19 23.6	16 4.8	+ 1 31.7	+0.3156	0.6013	0.1157	+43	-20		
21 Capricorni	6.5	1.66	10.4	17 53.5	16 35.4	+ 2 1.0	-1.1136	0.6009	0.1168	-42	-90		
$\theta$ Capricorni	4.1	+1.64	+10.3	-17 36.0	18 34.7	+ 3 55.7	-1.1666	0.5994	+0.1210	-46	-90		
B. D.-17°, 6216	6.1	1.60	10.6	17 43.6	22 11.6	+ 7 23.9	-0.5913	0.5966	0.1284	- 5	-80		
30 Capricorni	5.4	1.60	10.8	18 22.3	23 18.9	+ 8 28.5	+0.1950	0.5958	0.1306	+38	-27		
31 Capricorni	6.3	1.59	10.7	17 51.0	23 26.5	+ 8 35.9	-0.3079	0.5956	0.1308	+10	-57		
$\iota$ Capricorni	4.3	1.57	10.6	17 13.7	28 1 2.1	+10 7.8	-0.7158	0.5944	0.1339	-12	-90		
$\gamma$ Capricorni	3.7	+1.50	+10.8	-17 4.8	8 13.1	- 6 58.0	+0.1457	0.5885	+0.1472	+36	-30		
$\delta$ Capricorni	2.9	1.47	10.6	16 32.8	11 3.5	- 4 14.0	+0.0379	0.5862	0.1520	+31	-36		
B.D.-17°, 6389	6.5	1.44	10.9	17 16.6	12 22.0	- 2 58.5	+0.9687	0.5851	0.1542	+73	+19		
$\iota$ Aquarii	4.4	1.36	10.3	14 19.1	19 7.7	+ 3 32.0	-0.9195	0.5794	0.1648	-21	-90		
39 Aquarii	6.2	1.33	10.4	14 38.9	21 38.9	+ 5 57.7	-0.1678	0.5773	0.1684	+22	-48		
42 Aquarii	5.5	+1.31	+10.1	-13 17.6	23 30.6	+ 7 45.3	-1.2190	0.5757	+0.1710	-46	-90		
45 Aquarii	6.1	1.30	10.2	13 46.1	29 0 26.6	+ 8 39.2	-0.5802	0.5750	0.1722	0	-77		
50 Aquarii	5.9	1.27	10.4	13 59.9	2 45.9	+10 53.4	+0.0553	0.5730	0.1753	+35	-35		
Bradley 2961	6.2	1.24	10.2	13 23.3	5 9.7	-10 48.1	-0.1371	0.5711	0.1783	+25	-46		
70 Aquarii	6.1	1.15	9.4	11 2.6	13 14.4	- 3 0.5	-1.0393	0.5646	0.1875	-26	-90		
74 Aquarii	5.8	+1.12	+ 9.8	-12 6.5	15 26.1	- 0 53.5	+0.4572	0.5629	+0.1897	+61	-13		
$\psi^1$ Aquarii	4.5	1.01	8.9	9 35.5	30 1 30.4	+ 8 50.1	-0.1565	0.5553	0.1984	+27	-47		
$\psi^2$ Aquarii	4.6	0.99	8.9	9 41.3	2 26.4	+ 9 44.2	+0.1273	0.5546	0.1991	+42	-31		
$\psi^3$ Aquarii	5.2	0.98	9.0	10 7.0	2 55.2	+10 12.1	+0.6633	0.5543	0.1995	+78	- 2		
B.D.-10°, 6120	6.3	0.93	8.8	9 46.5	7 32.8	- 9 19.7	+1.2455	0.5511	0.2026	+80	+41		
B. A. C. 8214	6.5	+0.90	+ 8.2	- 7 58.6	10 34.4	- 6 24.2	+0.0106	0.5491	+0.2044	+36	-37		
Mayer 1012	6.3	0.84	7.7	6 53.7	16 40.3	- 0 30.3	+0.1494	0.5452	0.2075	+45	-30		
30 Piscium	4.7	+0.76	+ 7.3	- 6 31.7	23 2.7	+ 5 39.7	+1.1033	0.5415	+0.2100	+83	+27		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.												
JULY.												
THE STAR'S					AT CONJUNCTION IN R. A.							Limiting
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, $H$	$Y$	$x'$	$y'$	N.	S.	
		$\Delta\alpha$	$\Delta\delta$									
		$s$	$"$									
33 Piscium	4.7	+0.74	+7.3	- 6 13.5	1 0 39.9	+ 7 13.8	+1.1298	0.5406	+0.2105	+84	+29	
Piazz i o, 1	6.0	0.72	7.0	5 45.8	3 3.4	+ 9 32.7	+1.1539	0.5393	0.2112	+84	+31	
B. A. C. 81	6.3	0.65	5.7	2 43.9	9 55.9	- 7 47.9	-0.5546	0.5360	0.2125	+ 8	-74	
14 Ceti	5.4	0.61	4.9	1 0.9	15 20.0	- 2 33.9	-1.2090	0.5336	0.2130	-37	-90	
20 Ceti	4.9	0.51	4.9	- 1 38.9	23 59.1	+ 5 49.1	+1.3030	0.5304	0.2127	+88	+47	
26 Ceti	6.0	+0.46	+3.8	+ 0 52.2	2 5 22.0	+11 2.2	-0.2182	0.5287	+0.2120	+26	-51	
33 Ceti	6.1	0.43	3.3	1 57.1	8 45.0	- 9 41.1	-0.6508	0.5278	0.2113	+ 2	-83	
Piscium	5.1	0.40	2.7	3 7.5	12 23.4	- 6 9.3	-1.1327	0.5270	0.2104	-29	-87	
Lalande 2632	6.5	0.35	2.6	3 3.2	16 58.9	- 1 42.1	-0.0950	0.5260	0.2090	+32	-43	
Piscium	4.6	0.28	1.6	5 1.1	3 0 20.6	+ 5 26.4	-0.6676	0.5249	0.2060	+ 2	-83	
Piazz i, 249	6.5	+0.18	+0.4	+ 7 17.4	12 15.0	- 7 0.6	-0.6949	0.5239	+0.1997	0	-83	
64 Ceti	5.8	0.15	0.0	8 8.1	15 34.1	- 3 47.4	-0.9479	0.5239	0.1977	-16	-82	
Ceti	4.5	0.15	-0.1	8 24.6	16 24.0	- 2 59.1	-1.0818	0.5239	0.1973	-26	-82	
25 Arietis	6.5	0.08	0.8	9 47.1	23 44.6	+ 4 8.4	-1.1434	0.5240	0.1922	-31	-80	
Ceti	4.5	0.08	0.2	8 2.6	4 0 8.3	+ 4 31.3	+0.8198	0.5241	0.1917	+90	+10	
B. F. 310	6.3	+0.07	-0.6	+ 9 9.0	0 51.4	+ 5 13.1	-0.2423	0.5241	+0.1911	+25	-49	
85 Ceti	6.3	0.02	1.2	10 20.7	7 25.0	+11 34.9	-0.3031	0.5246	0.1859	+21	-52	
Ceti	4.3	+0.01	1.0	9 43.3	8 39.6	-11 12.7	+0.6056	0.5247	0.1848	+79	- 2	
W. B. ii, 1033	5.8	-0.08	2.2	12 49.7	19 32.1	- 0 39.8	-0.8255	0.5262	0.1747	- 9	-77	
B.D.+12°, 473	6.2	0.16	2.3	12 18.0	5 4 31.4	+ 8 3.3	+1.2823	0.5278	0.1652	+90	+52	
Mayer 121	6.4	-0.21	-3.2	+15 7.5	11 19.9	- 9 20.6	-0.7170	0.5293	+0.1575	- 2	-75	
B. A. C. 1239	6.3	0.30	3.8	17 2.0	22 41.5	+ 1 40.1	-1.1093	0.5320	0.1433	-30	-73	
Piazz iiii, 249	6.1	0.32	3.8	17 5.4	6 2 21.0	+ 5 12.8	-0.6582	0.5329	0.1384	+ 1	-70	
B. D.+16°, 569	6.2	0.34	3.8	17 2.3	4 35.3	+ 7 23.0	-0.2934	0.5335	0.1353	+21	-45	
Tauri	3.9	0.37	3.9	17 19.4	9 43.0	-11 38.9	+0.0662	0.5349	0.1281	+42	-24	
63 Tauri	5.7	-0.37	-3.8	+16 33.6	9 58.1	-11 24.3	+0.9422	0.5349	+0.1278	+90	+25	
Tauri	4.9	0.38	3.9	17 13.7	10 17.4	-11 5.5	+0.2453	0.5350	0.1273	+52	-15	
Tauri	4.3	0.38	4.0	17 42.9	10 58.0	-10 26.2	-0.2066	0.5352	0.1263	+26	-39	
B.D.+17°, 750	6.2	0.41	4.1	17 49.2	14 55.4	- 6 36.2	+0.1659	0.5362	0.1206	+48	-18	
Mayer 177	6.1	0.45	4.2	18 33.9	21 7.5	- 0 35.7	+0.0591	0.5378	0.1112	+41	-23	
i Tauri	5.2	-0.46	-4.2	+18 40.9	23 36.1	+ 1 48.2	+0.2021	0.5384	+0.1073	+50	-15	
B.D.+19°, 811	6.2	0.47	4.3	19 20.0	7 1 20.3	+ 3 29.1	-0.3372	0.5389	0.1045	+19	-45	
Mayer 198	6.3	0.51	4.3	19 40.7	6 27.0	+ 8 26.2	-0.2054	0.5403	0.0963	+26	-36	
m Tauri	5.0	0.49	4.1	18 31.2	7 22.1	+ 9 19.5	+1.1666	0.5404	0.0948	+90	+48	
Tauri	5.2	0.51	4.4	20 17.7	7 32.3	+ 9 29.3	-0.7855	0.5405	0.0945	- 8	-70	
107 Tauri	6.5	-0.51	-4.3	+19 44.3	8 2.6	+ 9 58.7	-0.1211	0.5406	+0.0937	+31	-31	
B. A. C. 1639	6.2	0.54	4.3	20 2.2	13 3.1	- 9 10.4	-0.0032	0.5418	0.0853	+37	-23	
B. A. C. 1651	6.5	0.54	4.2	19 43.2	13 52.3	- 8 22.7	+0.4179	0.5420	0.0840	+65	- 1	
Piazz i v, 125	6.1	0.58	4.2	20 24.5	19 56.9	- 2 29.8	+0.1328	0.5434	0.0735	+46	-15	
Tauri	3.0	0.59	4.3	21 5.1	21 50.7	- 0 39.7	-0.4834	0.5436	+0.0703	+10	-51	
NEW MOON.												
B. A. C. 3209	6.3	-0.50	-0.4	+16 59.2	12 10 23.2	+ 8 22.3	+0.8774	0.5378	-0.1235	+90	+22	
8 Leonis	5.9	0.46	-0.1	16 51.3	16 1.6	-10 9.9	+0.3026	0.5363	0.1317	+56	-12	
B.D.+16°, 2077	6.3	0.37	+0.4	16 12.6	18 6 12.5	+ 3 34.6	-0.9941	0.5328	0.1508	-21	-74	
34 Leonis	6.4	-0.33	+0.1	+13 48.9	9 11.5	+ 6 28.1	+1.1784	0.5321	-0.1546	+90	+42	
37 Leonis	5.5	0.32	0.3	14 11.5	11 42.5	+ 8 54.4	+0.3707	0.5315	0.1576	+60	-11	
Leonis	5.3	-0.17	0.2	11 2.2	14 4 6.6	+ 0 48.6	+1.0764	0.5281	0.1757	+90	+29	
Virginis	5.4	+0.06	0.6	8 39.0	15 5 6.7	+ 1 3.4	-1.0053	0.5254	0.1967	-20	-81	
Virginis	4.2	0.11	0.2	7 3.0	8 53.0	+ 4 43.0	-0.0278	0.5254	0.1991	+36	-38	
B.D.+6°, 2543	6.5	+0.20	+0.4	+ 6 4.7	17 59.6	-10 26.8	-0.8187	0.5255	-0.2042	- 7	-84	
Virginis	5.1	0.29	0.0	3 49.8	16 2 25.8	- 2 15.6	-0.1511	0.5263	0.2080	+29	-46	
Piazz i xii, 142	5.9	0.40	-0.1	+ 2 22.0	11 31.3	+ 6 33.1	-0.4950	0.5278	0.2110	+11	-69	
80 Virginis	5.6	0.76	1.2	- 4 55.4	17 15 48.3	+ 9 57.7	+1.1778	0.5368	0.2120	+85	+33	
Piazz i xiii, 174	6.4	0.80	1.1	5 1.9	19 52.0	-10 6.3	+0.4294	0.5386	0.2110	+64	-14	
Lalande 26147	6.5	+1.02	-1.0	- 7 6.4	18 12 2.1	+ 5 32.4	-0.7774	0.5474	-0.2043	- 8	-90	

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		s	"	°	d h m	h m				°	°		
$\xi^1$ Libræ	5.7	+1.25	-1.3	-11 31.2	19 4 39.6	-2 23.6	+0.4581	0.5587	-0.1921	+62	-13		
$\xi^2$ Libræ	5.7	1.26	1.0	11 2.1	5 43.9	-1 21.5	-0.2429	0.5594	0.1911	+21	-52		
17 Libræ	6.4	1.27	0.9	10 46.9	6 23.2	-0 43.6	-0.6263	0.5599	0.1905	0	-82		
18 Libræ	5.9	1.27	0.9	10 46.3	6 41.4	-0 26.0	-0.6951	0.5601	0.1901	-4	-90		
$\gamma$ Libræ	4.1	1.51	0.8	14 28.8	22 38.5	-9 2.7	+0.1822	0.5725	0.1719	+42	-28		
Bradley 1987	6.5	+1.55	-0.5	-14 44.7	20 1 59.9	-5 48.7	-0.1189	0.5752	-0.1673	+24	-45		
$\eta$ Libræ	5.5	1.56	0.7	15 22.6	2 16.3	-5 32.9	+0.4733	0.5754	0.1670	+59	-12		
$\theta$ Libræ	4.4	1.62	0.6	16 27.4	6 21.3	-1 37.0	+0.8909	0.5787	0.1610	+74	+14		
B.D.-14° 43'14	6.2	1.62	0.0	14 33.4	7 31.4	-0 29.4	-1.2087	0.5797	0.1592	-46	-90		
49 Libræ	5.4	1.63	-0.5	16 15.6	9 6.1	+1 1.8	+0.2553	0.5810	0.1567	+44	-24		
$\chi$ Ophiuchi	4.9	+1.80	+0.2	-18 14.7	19 58.5	+11 29.4	+0.6387	0.5898	-0.1381	+67	-2		
24 Scorpii	5.0	1.86	1.1	17 33.7	21 1 48.7	-6 54.1	-0.8168	0.5944	0.1269	-19	-90		
B. A. C. 5700	6.1	1.94	1.3	19 23.6	7 53.7	-1 3.1	+0.2715	0.5990	0.1144	+41	-22		
B. A. C. 5712	6.5	1.94	1.7	18 6.2	8 57.6	-0 2.0	-1.1298	0.5998	0.1121	-43	-90		
29 Ophiuchi	6.4	1.96	1.7	18 44.9	9 46.7	+0 45.2	-0.5798	0.6003	0.1103	-7	-79		
B. A. C. 5746	6.2	+1.99	+1.5	-20 21.8	10 52.9	+1 48.7	+0.9033	0.6011	-0.1079	+70	+15		
$\xi$ Ophiuchi	4.4	2.06	2.0	21 0.8	17 8.3	+7 48.9	+0.9126	0.6054	0.0938	+69	+16		
B. A. C. 5866	5.9	2.08	2.2	21 21.3	18 33.6	+9 10.8	+1.1194	0.6063	0.0905	+69	+34		
58 Ophiuchi	4.8	2.14	3.1	21 38.3	22 1 40.6	-7 59.8	+0.8128	0.6105	0.0733	+68	+10		
B. A. C. 6081	6.4	2.17	4.2	20 19.9	7 55.2	-2 0.8	-0.8834	0.6137	0.0575	-30	-90		
B. A. C. 6125	6.2	+2.21	+4.3	-21 27.2	10 35.1	+0 32.4	+0.0762	0.6149	-0.0506	+23	-33		
$\mu$ Sagittarii	4.1	2.22	4.8	21 4.9	13 2.2	+2 53.3	-0.4042	0.6159	0.0442	-3	-64		
14 Sagittarii	5.6	2.23	4.6	21 44.2	13 12.8	+3 3.5	+0.2319	0.6160	0.0438	+32	-24		
15 Sagittarii	5.3	2.22	4.9	20 45.3	13 34.8	+3 24.5	-0.7498	0.6161	0.0428	-23	-90		
16 Sagittarii	5.9	2.21	4.9	20 24.9	13 35.2	+3 24.9	-1.0846	0.6161	0.0428	-46	-90		
21 Sagittarii	5.0	+2.24	+5.4	-20 35.4	17 20.3	+7 0.5	-1.0527	0.6174	-0.0328	-44	-90		
Bradley 2332	5.7	2.27	5.8	21 28.4	21 57.6	+11 26.0	-0.3074	0.6187	0.0203	0	-57		
B. A. C. 6347	5.9	2.27	5.9	21 7.6	22 19.9	+11 47.4	-0.6545	0.6188	0.0193	-19	-89		
B.D.-21° 51'31	6.3	2.28	6.3	21 5.7	23 0 41.5	-9 57.1	-0.7243	0.6192	0.0128	-24	-90		
28 Sagittarii	5.6	2.30	6.2	22 29.3	1 3.0	-9 36.5	+0.6382	0.6193	0.0119	+58	-1		
30 Sagittarii	6.2	+2.30	+6.4	-22 16.0	2 42.5	-8 1.3	+0.4054	0.6196	-0.0073	+40	-15		
33 Sagittarii	5.8	2.30	6.7	21 28.3	3 52.9	-6 53.9	-0.3809	0.6197	0.0041	-6	-62		
$\nu^1$ Sagittarii	5.0	2.32	6.6	22 51.5	3 55.3	-6 51.6	+0.9777	0.6197	0.0040	+67	-22		
$\nu^2$ Sagittarii	5.1	2.32	6.6	22 47.2	4 16.1	-6 31.6	+0.9059	0.6197	0.0031	+67	+17		
$\xi^1$ Sagittarii	5.1	2.29	6.9	20 46.6	5 7.1	-5 42.9	-1.0659	0.6199	0.0007	-47	-90		
$\xi^2$ Sagittarii	3.7	+2.30	+6.9	-21 13.6	5 15.2	-5 35.0	-0.6238	0.6199	-0.0004	-19	-85		
B. A. C. 6485	6.3	2.33	6.9	22 49.5	6 39.7	-4 14.2	+0.9442	0.6200	+0.0035	+67	+19		
$\sigma$ Sagittarii	3.9	2.32	7.1	21 52.6	7 47.7	-3 9.0	+0.0201	0.6201	0.0066	+16	-37		
$\pi$ Sagittarii	3.0	2.31	7.5	21 10.2	9 40.4	-1 21.2	-0.6547	0.6201	0.0118	-20	-89		
B. A. C. 6561	6.4	2.32	7.5	21 48.7	10 39.3	-0 24.8	-0.0135	0.6202	0.0145	+15	-38		
Piazzi xix, 61	5.5	+2.34	+7.9	-22 34.4	13 38.7	+2 26.9	+0.7892	0.6201	+0.0227	+67	+8		
50 Sagittarii	5.5	2.33	8.2	21 57.5	15 44.4	+4 27.3	+0.2404	0.6199	0.0284	+31	-24		
B. A. C. 6671	6.1	2.33	8.4	21 30.2	17 25.9	+6 4.5	-0.1536	0.6197	0.0330	+9	-47		
$\sigma$ Capricorni	5.5	2.29	10.6	19 24.4	24 11 25.0	-0 42.1	-1.1846	0.6147	0.0804	-53	-90		
B.D.-18° 57'83	6.4	2.24	11.7	18 22.6	22 43.8	+10 8.5	-1.1323	0.6090	0.1078	-45	-90		
19 Capricorni	5.7	+2.22	+11.9	-18 16.4	25 0 49.0	-11 51.5	-1.0047	0.6078	+0.1125	-33	-90		
20 Capricorni	6.2	2.24	12.1	19 23.6	2 38.6	-10 6.4	+0.3065	0.6067	0.1166	+43	-21		
21 Capricorni	6.5	2.21	12.1	17 53.4	3 8.7	-9 37.5	-1.1133	0.6064	0.1177	-42	-90		
$\theta$ Capricorni	4.1	2.20	12.2	17 36.0	5 6.1	-7 44.9	-1.1657	0.6051	0.1220	-46	-90		
B.D.-17° 62'16	6.1	2.18	12.5	17 43.6	8 39.3	-4 20.2	-0.5947	0.6028	0.1296	-6	-80		
30 Capricorni	5.4	+2.18	+12.6	-18 22.3	9 45.3	-3 16.9	+0.1853	0.6020	+0.1318	+37	-27		
31 Capricorni	6.3	2.18	12.6	17 51.0	9 52.8	-3 9.7	-0.3136	0.6019	0.1321	+10	-57		
$\iota$ Capricorni	4.3	2.16	12.7	17 13.6	11 26.6	-1 39.6	-0.7182	0.6008	0.1353	-12	-90		
$\gamma$ Capricorni	3.7	2.12	13.1	17 4.7	18 28.9	+5 5.9	+0.1350	0.5957	0.1489	+36	-29		
$\delta$ Capricorni	2.9	2.10	13.1	16 32.8	21 15.6	+7 46.2	+0.0279	0.5936	0.1539	+31	-36		
B.D.-17° 63'89	6.5	+2.09	+13.4	-17 16.5	22 32.3	+8 59.9	+0.9492	0.5927	+0.1561	+73	+18		

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
♈ Aquarii	4.4	+2.02	+13.3	-14 19.0	26 5 8.4	- 8 39.2	-0.9200	0.5876	+0.1670	-21	-90
39 Aquarii	6.2	2.01	13.4	14 38.9	7 35.8	- 6 17.4	-0.1765	0.5855	0.1708	+21	-48
42 Aquarii	5.5	1.99	13.3	13 17.5	9 24.7	- 4 32.7	-1.2159	0.5842	0.1734	-45	-90
45 Aquarii	6.1	1.98	13.4	13 46.0	10 19.3	- 3 40.1	-0.5843	0.5835	0.1748	0	-78
50 Aquarii	5.9	1.96	13.6	13 59.8	12 35.0	- 1 29.4	+0.0437	0.5816	0.1779	+34	-35
Bradley 2961	6.2	+1.94	+13.5	-13 23.3	14 54.8	+ 0 45.2	-0.1465	0.5798	+0.1810	+24	-46
70 Aquarii	6.1	1.86	13.2	11 2.6	22 46.2	+ 8 19.3	-1.0374	0.5736	0.1905	-26	-90
74 Aquarii	5.8	1.85	13.5	12 6.4	27 0 54.1	+10 22.5	+0.4400	0.5720	0.1927	+60	-14
B.D.-11°, 6032	6.3	1.76	13.4	11 11.4	10 9.0	- 4 42.3	+1.3449	0.5650	0.2014	+79	+61
♊ Aquarii	4.5	1.77	13.1	9 35.4	10 40.7	- 4 11.6	-0.1656	0.5646	0.2018	+26	-47
♊ Aquarii	4.6	+1.74	+13.1	- 9 41.2	11 35.0	- 3 19.3	+0.1144	0.5639	+0.2025	+41	-31
♊ Aquarii	5.2	1.74	13.2	10 6.9	12 3.0	- 2 52.3	+0.6432	0.5636	0.2029	+77	- 2
B.D.-10°, 6120	6.3	1.70	13.1	9 46.4	16 32.2	+ 1 27.6	+1.2175	0.5604	0.2061	+80	+38
B. A. C. 8214	6.5	1.67	12.6	7 58.5	19 28.4	+ 4 17.7	-0.0004	0.5584	0.2078	+36	+38
Mayer 1012	6.3	1.64	12.3	6 53.6	28 1 23.2	+10 0.5	+0.1370	0.5544	0.2111	+44	-30
30 Piscium	4.7	+1.56	+12.1	- 6 31.7	7 34.1	- 8 1.0	+1.0781	0.5505	+0.2136	+83	+25
33 Piscium	4.7	1.54	12.0	6 13.5	9 8.3	- 6 29.9	+1.1043	0.5495	0.2141	+84	+27
Piazz i o, 1	6.0	1.52	11.8	5 45.7	11 27.5	- 4 15.3	+1.1283	0.5482	0.2147	+84	+29
B. A. C. 81	6.3	1.46	10.7	2 43.8	18 7.9	+ 2 12.0	-0.5557	0.5445	0.2160	+ 8	-74
14 Ceti	5.4	1.42	10.0	1 0.8	23 22.6	+ 7 16.5	-1.2006	0.5419	0.2164	-36	-90
20 Ceti	4.9	+1.33	+10.0	- 1 38.8	29 7 47.1	- 8 35.1	+1.2758	0.5378	+0.2160	+88	+44
26 Ceti	6.0	1.29	9.0	+ 0 52.3	13 1.4	- 3 30.8	-0.2217	0.5361	0.2151	+26	-51
33 Ceti	6.1	1.26	8.5	1 57.2	16 19.1	- 0 19.2	-0.6484	0.5349	0.2143	+ 3	-82
f Piscium	5.1	1.23	7.9	3 7.6	19 52.0	+ 3 7.1	-1.1238	0.5337	0.2133	-28	-87
Lalande 2632	6.5	1.18	7.8	3 3.3	30 0 20.7	+ 7 27.4	-0.0983	0.5324	0.2116	+32	-43
v Piscium	4.6	+1.12	+ 6.8	+ 5 1.1	7 32.1	- 9 34.6	-0.6633	0.5307	+0.2085	+ 2	-82
Piazz i, 249	6.5	1.02	5.4	7 17.5	19 11.6	+ 1 43.5	-0.6891	0.5288	0.2018	0	-83
64 Ceti	5.8	0.99	4.9	8 8.2	22 26.9	+ 4 52.8	-0.9393	0.5284	0.1996	-15	-82
♈ Ceti	4.5	0.99	4.8	8 24.7	23 15.9	+ 5 40.3	-1.0718	0.5283	0.1990	-25	-82
25 Arietis	6.5	0.90	3.9	9 47.2	31 6 28.9	-11 19.8	-1.1325	0.5278	0.1935	-30	-80
♈ Ceti	4.5	+0.91	+ 4.6	+ 8 2.7	6 52.1	-10 57.3	+0.8126	0.5278	+0.1932	+90	+ 8
B.F. 310	6.3	0.91	4.2	9 9.1	7 34.6	-10 16.1	-0.2395	0.5278	0.1926	+25	-49
85 Ceti	6.3	0.85	3.5	10 20.8	14 2.2	- 4 0.3	-0.2991	0.5277	0.1871	+21	-52
μ Ceti	4.3	+0.84	+ 3.6	+ 9 43.4	15 15.8	- 2 48.9	+0.6022	0.5277	+0.1860	+79	- 2

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W. B. ii, 1033	5.8	+0.75	+ 2.0	+12 49.8	1 2 0.0	+ 7 35.6	-0.8165	0.5283	+0.1755	- 9	-77
B.D. +12°, 473	6.2	0.66	1.8	12 18.0	10 53.8	- 7 46.9	+1.2784	0.5292	0.1658	+90	+52
Mayer 121	6.4	0.60	+ 0.5	15 7.6	17 39.0	- 1 14.1	-0.7080	0.5302	0.1578	- 2	-75
B. A. C. 1239	6.3	+0.50	- 0.6	+17 2.1	2 4 56.4	+ 9 42.5	-1.0984	0.5321	+0.1434	-29	-73
Piazz i, iii, 249	6.1	0.47	0.7	17 5.5	8 34.9	-10 45.8	-0.6492	0.5329	0.1384	+ 2	-70
B.D. +16, 569	6.2	0.45	0.8	17 2.3	10 48.7	- 8 36.1	-0.2860	0.5333	0.1353	+22	-45
♈ Tauri	3.9	0.40	1.1	17 19.5	15 55.3	- 3 39.1	+0.0724	0.5344	0.1280	+42	-24
63 Tauri	5.7	0.39	0.8	16 33.6	16 10.3	- 3 24.5	+0.9452	0.5344	0.1277	+90	+26
♈ Tauri	4.9	+0.39	- 1.0	+17 13.7	16 29.6	- 3 5.8	+0.2508	0.5345	+0.1272	+53	-14
♈ Tauri	4.3	0.39	1.2	17 42.9	17 10.0	- 2 26.7	-0.1992	0.5346	0.1262	+27	-39
B.D. +17°, 750	6.2	0.35	1.4	17 49.2	21 6.9	+ 1 22.8	+0.1720	0.5355	0.1204	+48	-17
Mayer 177	6.1	0.30	1.8	18 34.0	8 3 18.4	+ 7 22.5	+0.0656	0.5370	0.1109	+42	-22
i Tauri	5.2	0.27	1.9	18 40.9	5 46.7	+ 9 46.3	+0.2082	0.5375	0.1071	+50	-14
B.D. +19°, 811	6.2	+0.26	- 2.1	+19 20.1	7 30.9	+11 27.1	-0.3295	0.5379	+0.1043	+19	-44
Mayer 198	6.3	0.21	2.3	19 40.7	12 37.3	- 7 36.2	-0.1982	0.5391	0.0961	+27	-36
m Tauri	5.0	0.22	2.0	18 31.2	13 32.5	- 6 42.8	+1.1706	0.5393	0.0946	+90	+48
l Tauri	5.2	0.20	2.6	20 17.7	13 42.6	- 6 32.9	-0.7770	0.5394	0.0943	- 7	-70
107 Tauri	6.5	0.20	2.4	19 44.3	14 13.0	- 6 3.6	-0.1141	0.5394	0.0935	+31	-30
B. A. C. 1639	6.2	+0.16	- 2.6	+20 2.2	19 13.5	- 1 12.5	+0.0033	0.5405	+0.0851	+38	-23

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	'	d h m	h m				'	'
B. A. C. 1651	6.5	+0.14	-2.5	+19 43.2	8 20 2.7	- 0 25.0	+0.4235	0.5407	+0.0837	+65	- 1
Piazz v, 125	6.1	0.09	2.7	20 24.5	4 2 7.4	+ 5 28.1	+0.1387	0.5420	0.0733	+46	-14
$\zeta$ Tauri	3.0	+0.08	3.0	21 5.1	4 1.3	+ 7 18.4	-0.4765	0.5424	0.0700	+11	-50
$\chi^2$ Orionis	4.5	0.00	2.8	20 15.5	12 1.7	- 8 56.7	+0.9443	0.5439	0.0557	+90	+34
141 Tauri	6.3	-0.02	3.4	22 23.9	15 27.1	- 5 38.0	-1.2501	0.5445	0.0496	-54	-68
B. A. C. 1970	6.0	-0.04	-3.3	+22 12.3	19 10.8	- 2 1.4	-0.8633	0.5451	+0.0427	-13	-68
$\eta$ Geminorum	3.5	0.06	3.4	22 32.0	21 42.2	+ 0 25.0	-1.1266	0.5455	0.0381	-36	-67
$\mu$ Geminorum	3.2	0.09	3.4	22 33.7	5 1 31.3	+ 4 6.6	-1.0256	0.5461	0.0310	-26	-67
15 Geminorum	6.5	0.11	3.0	20 50.8	3 50.2	+ 6 21.0	+0.9460	0.5463	0.0267	+90	+36
$\delta$ Geminorum	5.2	0.19	3.1	21 52.2	15 1.8	- 6 49.3	-0.0105	0.5474	+0.0050	+37	-16
NEPTUNE				+21 57.1	20 51.0	- 1 11.5	-0.1005	0.5462	-0.0052	+32	-21
44 Geminorum	5.9	-0.22	-3.2	22 46.6	21 29.6	- 0 34.2	-1.0197	0.5477	0.0066	-26	-67
Lalande 13849	6.5	0.24	2.9	21 24.5	23 47.5	+ 1 39.2	+0.4791	0.5478	0.0109	+70	+10
$\delta$ Geminorum	3.5	0.26	2.9	22 9.2	6 4 29.1	+ 6 11.5	-0.4199	0.5478	0.0199	+14	+42
56 Geminorum	5.2	0.26	2.7	20 37.1	5 22.5	+ 7 3.2	+1.2653	0.5478	0.0215	+90	+67
B. A. C. 2455	6.4	-0.29	-2.8	+21 43.3	7 40.3	+ 9 16.6	-0.0129	0.5478	-0.0258	+37	-18
63 Geminorum	5.3	0.28	-2.8	21 38.1	8 5.1	+ 9 40.5	+0.0717	0.5478	0.0266	+42	-13
NEW MOON.											
$\omega$ Virginis	5.4	0.11	+1.2	8 39.0	11 10 42.8	+ 8 26.9	-1.0603	0.5273	0.1979	-24	-81
$\nu$ Virginis	4.2	-0.08	+1.0	+ 7 3.1	14 28.5	-11 54.2	-0.0840	0.5271	-0.2003	+33	-41
B. D. +6°, 2543	6.5	-0.02	1.2	6 4.7	23 34.5	- 3 4.6	-0.8810	0.5268	0.2052	-11	-84
$\epsilon$ Virginis	5.1	+0.05	1.0	3 49.8	12 8 1.1	+ 5 6.8	-0.2161	0.5269	0.2087	+26	-50
Piazz xii, 142	5.9	0.13	1.1	+ 2 22.0	17 8.3	-10 2.5	-0.5655	0.5277	0.2113	+ 7	-74
80 Virginis	5.6	0.44	0.2	- 4 55.4	13 21 39.6	- 6 23.6	+1.1084	0.5340	0.2112	+85	+27
Piazz xiii, 174	6.4	+0.48	+0.3	- 5 1.8	14 1 46.6	- 2 24.3	+0.3536	0.5354	-0.2101	+58	-19
$\pi$ Virginis	6.5	0.51	0.0	6 22.4	3 54.8	- 0 20.1	+1.3173	0.5363	0.2094	+84	+50
Lalande 26147	6.5	0.67	+0.4	7 6.4	18 13.1	-10 29.1	-0.8680	0.5425	0.2027	-12	-90
$\xi$ Libræ	5.7	0.89	-0.1	11 31.2	15 11 12.8	+ 5 57.1	+0.3804	0.5518	0.1898	+56	-17
$\zeta$ Libræ	5.7	0.90	+0.2	11 2.1	12 18.8	+ 7 0.9	-0.3294	0.5525	0.1888	+16	-58
17 Libræ	6.4	+0.91	+0.3	-10 46.9	12 59.0	+ 7 39.7	-0.7177	0.5529	-0.1882	- 5	-90
18 Libræ	5.9	0.91	0.3	10 46.2	13 17.7	+ 7 57.8	-0.7874	0.5531	0.1879	- 9	-90
$\gamma$ Libræ	4.1	1.16	0.1	14 28.8	16 5 41.2	- 0 12.4	+0.1029	0.5639	0.1693	+37	-32
Bradley 1987	6.5	1.20	0.2	14 44.7	9 8.6	+ 3 7.7	-0.2018	0.5663	0.1647	+20	-50
$\eta$ Libræ	5.5	1.21	0.0	15 22.6	9 25.4	+ 3 23.8	+0.3992	0.5665	0.1643	+54	-16
$\theta$ Libræ	4.4	+1.28	+0.1	-16 27.4	13 38.0	+ 7 27.5	+0.8240	0.5695	-0.1583	+74	+ 9
B. D. -14°, 4314	6.2	1.27	0.8	14 33.4	14 50.3	+ 8 37.2	-1.3069	0.5704	0.1565	-62	-90
49 Libræ	5.4	1.28	0.1	16 15.6	16 27.9	+10 11.3	+0.1795	0.5716	0.1540	+40	-28
$\chi$ Ophiuchi	4.9	1.48	0.6	18 14.7	17 3 41.4	- 3 0.0	+0.5724	0.5797	0.1355	+63	- 6
24 Scorpii	5.0	1.55	1.4	17 33.7	9 43.3	+ 2 48.4	-0.9039	0.5840	0.1244	-24	-90
Bradley 2115	5.5	+1.58	+0.7	-19 44.8	9 49.0	+ 2 53.8	+1.2956	0.5840	-0.1242	+70	+61
Mayer 679	5.9	1.64	1.0	20 15.6	14 31.2	+ 7 25.3	+1.2501	0.5873	0.1150	+70	+50
B. A. C. 5700	6.1	1.66	1.4	19 23.6	16 0.6	+ 8 51.3	+0.2042	0.5884	0.1120	+37	-26
B. A. C. 5712	6.5	1.65	1.9	18 6.2	17 6.7	+ 9 54.9	-1.2188	0.5891	0.1098	-53	-90
29 Ophiuchi	6.4	1.67	1.8	18 44.9	17 57.4	+10 43.6	-0.6598	0.5897	0.1080	-11	-88
B. A. C. 5746	6.2	+1.71	+1.4	-20 21.8	19 5.8	+11 49.3	+0.8474	0.5905	-0.1057	+70	+11
$\xi$ Ophiuchi	4.4	1.82	1.8	21 0.8	18 1 33.9	- 5 57.7	+0.8599	0.5947	0.0917	+69	+13
B. A. C. 5866	5.9	1.82	1.9	21 21.3	3 2.1	- 4 33.0	+1.0707	0.5956	0.0885	+69	+29
58 Ophiuchi	4.8	1.92	2.7	21 38.3	10 23.3	+ 2 30.7	+0.7629	0.5999	0.0715	+68	+ 6
B. A. C. 6081	6.4	1.99	3.9	20 19.9	16 50.2	+ 8 42.1	-0.9554	0.6032	0.0560	-35	-90
B. A. C. 6125	6.2	+2.03	+3.9	-21 27.2	19 35.3	+11 20.5	+0.0202	0.6045	-0.0492	+20	-37
$\mu$ Sagittarii	4.1	2.05	4.3	21 4.9	22 7.0	-10 14.0	-0.4656	0.6056	0.0429	- 7	-69
14 Sagittarii	5.6	2.06	4.1	21 44.2	22 17.9	-10 3.5	+0.1799	0.6057	0.0424	+28	-27
15 Sagittarii	5.3	2.05	4.5	20 45.3	22 40.7	- 9 41.7	-0.8159	0.6059	0.0415	-27	-90
16 Sagittarii	5.9	2.05	4.6	20 24.9	22 41.0	- 9 41.4	-1.1556	0.6059	0.0415	-53	-90
21 Sagittarii	5.0	+2.09	+5.0	-20 35.4	19 2 33.1	- 5 58.7	-1.1203	0.6074	-0.0316	-50	-90

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
Bradley 2332	5.7	+2.15	+ 5.3	-21 28.4	19 7 18.8	- 1 24.8	-0.3610	0.6089	-0.0193	- 3	-61
B. A. C. 6347	5.9	2.15	5.4	21 7.7	7 41.7	- 1 2.8	-0.7126	0.6091	0.0183	-23	-90
B.D.-21°, 5131	6.3	2.18	5.8	21 5.7	10 7.4	+ 1 16.9	-0.7815	0.6097	0.0120	-27	-90
28 Sagittarii	5.6	2.20	5.5	22 29.3	10 29.6	+ 1 38.1	+0.5997	0.6098	0.0110	+54	- 3
30 Sagittarii	6.2	2.21	5.8	22 16.0	12 12.0	+ 3 16.3	+0.3649	0.6103	0.0065	+37	-17
33 Sagittarii	5.8	+2.21	+ 6.1	-21 28.3	13 24.3	+ 4 25.6	-0.4309	0.6106	-0.0033	- 8	-66
♄ Sagittarii	5.0	2.23	5.8	22 51.5	13 26.9	+ 4 28.1	+0.9456	0.6105	0.0032	+67	+20
♊ Sagittarii	5.1	2.24	5.8	22 47.2	13 48.2	+ 4 48.6	+0.8731	0.6106	-0.0023	+67	+14
♋ Sagittarii	5.1	2.21	6.4	20 46.6	14 40.6	+ 5 38.7	-1.1238	0.6107	0.0000	-53	-90
♌ Sagittarii	3.7	2.22	6.4	21 13.7	14 48.9	+ 5 46.7	-0.6758	0.6107	+0.0004	-21	-90
B. A. C. 6485	6.3	+2.26	+ 6.2	-22 49.5	16 15.8	+ 7 10.0	+0.9134	0.6111	+0.0042	+67	+17
♍ Sagittarii	3.9	2.26	6.5	21 52.6	17 25.6	+ 8 17.0	-0.0216	0.6112	0.0073	+14	-39
♎ Sagittarii	3.0	2.26	6.9	21 10.2	19 21.4	+10 7.9	-0.7034	0.6115	0.0124	-23	-90
B. A. C. 6561	6.4	2.28	6.9	21 48.7	20 21.8	+11 5.8	-0.0534	0.6116	0.0151	+13	-41
Piazzi xix, 61	5.5	2.31	7.2	22 34.4	23 25.8	- 9 57.9	+0.7612	0.6118	0.0232	+67	+ 6
50 Sagittarii	5.5	+2.32	+ 7.6	-21 57.5	20 1 34.6	- 7 54.4	+0.2075	0.6119	+0.0288	+29	-26
B. A. C. 6671	6.1	2.33	7.9	21 30.2	3 18.6	- 6 14.8	-0.1895	0.6119	0.0334	+ 8	-49
♏ Capricorni	5.5	2.40	10.5	19 24.4	21 39.9	+11 20.9	-1.2126	0.6094	0.0806	-56	-90
B.D.-18°, 5783	6.4	2.42	11.8	18 22.6	21 9 8.6	- 1 38.5	-1.1463	0.6053	0.1081	-46	-90
19 Capricorni	5.7	2.42	12.0	18 16.4	11 15.2	+ 0 22.9	-1.0154	0.6044	0.1129	-34	-90
20 Capricorni	6.2	+2.44	+12.1	-19 23.6	13 6.0	+ 2 9.3	+0.3050	0.6036	+0.1170	+43	-21
21 Capricorni	6.5	2.43	12.3	17 53.4	13 36.5	+ 2 38.5	-1.1217	0.6033	0.1182	-42	-90
♐ Capricorni	4.1	2.43	12.5	17 36.0	15 35.0	+ 4 32.3	-1.1720	0.6024	0.1225	-47	-90
B.D.-17°, 6216	6.1	2.43	12.8	17 43.6	19 10.0	+ 7 58.7	-0.5941	0.6006	0.1302	- 5	-80
30 Capricorni	5.4	2.44	12.9	18 22.3	20 16.6	+ 9 2.6	+0.1903	0.6000	0.1324	+37	-27
31 Capricorni	6.3	+2.44	+12.9	-17 50.9	20 24.0	+ 9 9.8	-0.3105	0.5999	+0.1327	+10	-57
♑ Capricorni	4.3	2.43	13.1	17 13.6	21 58.5	+10 40.5	-0.7148	0.5991	0.1359	-12	-90
♒ Capricorni	3.7	2.43	13.7	17 4.7	22 5 2.9	- 6 31.9	+0.1489	0.5950	0.1498	+37	-29
♓ Capricorni	2.9	2.43	13.8	16 32.7	7 50.0	- 3 51.2	+0.0445	0.5934	0.1549	+32	-35
B.D.-17°, 6389	6.5	2.42	14.0	17 16.5	9 6.9	- 2 37.3	+0.9685	0.5926	0.1572	+73	+19
♈ Aquarii	4.4	+2.39	+14.5	-14 19.0	15 43.0	+ 3 43.5	-0.8947	0.5884	+0.1684	-20	-90
39 Aquarii	6.2	2.39	14.6	14 38.9	18 10.2	+ 6 5.1	-0.1483	0.5868	0.1722	+23	-46
42 Aquarii	5.5	2.37	14.8	13 17.5	19 58.7	+ 7 49.5	-1.1847	0.5856	0.1750	-42	-90
45 Aquarii	6.1	2.38	14.8	13 46.0	20 53.1	+ 8 41.8	-0.5526	0.5850	0.1763	+ 2	-75
50 Aquarii	5.9	2.37	14.8	13 59.8	23 8.2	+10 51.9	+0.0774	0.5836	0.1796	+36	-33
Bradley 2961	6.2	+2.36	+15.0	-13 23.2	23 1 27.4	-10 54.1	-0.1098	0.5820	+0.1828	+26	-44
70 Aquarii	6.1	2.32	15.2	11 2.6	9 15.4	- 3 23.4	-0.9888	0.5768	0.1926	-23	-90
74 Aquarii	5.8	2.32	15.4	12 6.4	11 22.2	- 1 21.1	+0.4860	0.5754	0.1950	+63	-11
♉ Aquarii	4.5	2.28	15.4	9 35.4	21 2.1	+ 7 57.9	-0.1062	0.5692	0.2045	+29	-44
♊ Aquarii	4.6	2.26	15.4	9 41.2	21 55.7	+ 8 49.6	+0.1734	0.5686	0.2053	+45	-28
♋ Aquarii	5.2	+2.26	+15.5	-10 6.9	22 23.3	+ 9 16.2	+0.6998	0.5683	+0.2056	+80	0
B.D.-10°, 6120	6.3	2.24	15.5	9 46.4	24 2 48.7	-10 27.7	+1.2750	0.5655	0.2090	+80	+45
B. A. C. 8214	6.5	2.22	15.4	7 58.5	5 42.2	- 7 40.4	+0.0679	0.5637	0.2110	+40	-34
Mayer 1012	6.3	2.18	15.2	6 53.6	11 31.0	- 2 3.6	+0.2105	0.5602	0.2143	+48	-26
30 Piscium	4.7	2.15	15.1	6 31.6	17 35.0	+ 3 48.0	+1.1503	0.5568	0.2170	+83	+31
33 Piscium	4.7	+2.14	+15.1	- 6 13.4	19 7.5	+ 5 17.3	+1.1778	0.5560	+0.2176	+84	+33
Piazzi o, 1	6.0	2.13	15.0	5 45.7	21 23.9	+ 7 29.1	+1.2038	0.5547	0.2183	+84	+36
B. A. C. 81	6.3	2.09	14.3	2 43.8	25 3 55.9	-10 12.1	-0.4589	0.5514	0.2197	+13	-66
14 Ceti	5.4	2.07	13.8	1 0.8	9 3.7	- 5 14.4	-1.0923	0.5490	0.2201	-26	-90
20 Ceti	4.9	2.00	13.7	- 1 38.7	17 16.6	+ 2 42.3	+1.3672	0.5455	0.2198	+88	+63
26 Ceti	6.0	+1.98	+13.0	+ 0 52.3	22 23.3	+ 7 39.1	-0.1104	0.5435	+0.2189	+32	-44
33 Ceti	6.1	1.96	12.6	1 57.3	26 1 36.2	+10 45.9	-0.5297	0.5424	0.2181	+ 9	-71
♊ Piscium	5.1	1.94	12.1	3 7.7	5 3.9	- 9 53.1	-0.9972	0.5413	0.2170	-19	-87
Lalande 2632	6.5	1.90	11.9	3 3.4	9 25.9	- 5 39.5	+0.0206	0.5400	0.2154	+39	-36
♋ Piscium	4.6	1.86	11.0	5 1.2	16 26.7	+ 1 8.0	-0.5330	0.5381	0.2121	+ 9	-71
Piazzi i, 249	6.5	+1.78	+ 9.7	+ 7 17.5	27 3 48.9	-11 51.4	-0.5516	0.5359	+0.2050	+ 8	-72

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	°	d h m	h m				°	°
64 Ceti	5.8	+1.76	+9.3	+ 8 8.2	27 6 59.5	- 8 46.8	-0.7972	0.5354	+0.2027	- 6	-82
$\xi^1$ Ceti	4.5	1.76	9.2	8 24.8	7 47.3	- 8 0.4	-0.9279	0.5353	0.2021	-14	-82
25 Arietis	6.5	1.70	8.1	9 47.3	14 50.0	- 1 11.0	-0.9848	0.5345	0.1964	-18	-80
$\xi^2$ Ceti	4.5	1.69	8.8	8 2.8	15 12.7	- 0 48.9	+0.9397	0.5345	0.1961	+90	+17
B. F. 310	6.3	1.70	8.4	9 9.2	15 54.2	- 0 8.7	-0.1009	0.5344	0.1955	+32	-41
85 Ceti	6.3	+1.65	+7.6	+10 20.9	22 13.0	+ 5 58.2	-0.1573	0.5340	+0.1897	+29	-44
$\mu$ Ceti	4.3	1.65	7.7	9 43.4	23 24.9	+ 7 7.9	+0.7351	0.5340	0.1885	+90	+ 5
W. B. ii, 1033	5.8	1.56	6.0	12 49.9	28 9 55.3	- 6 41.3	-0.6666	0.5338	0.1776	+ 1	-75
Mayer 121	6.4	1.44	4.1	15 7.6	29 1 16.6	+ 8 11.2	-0.5578	0.5346	0.1592	+ 7	-66
B. A. C. 1239	6.3	1.35	2.6	17 2.1	12 23.0	- 5 3.3	-0.9457	0.5356	0.1443	-17	-73
Piazzi iii, 249	6.1	+1.31	+2.4	+17 5.5	15 58.2	- 1 34.9	-0.5006	0.5361	+0.1392	+10	-59
B. D.+16°, 569	6.2	1.29	2.3	17 2.4	18 10.2	+ 0 33.0	-0.1404	0.5364	0.1360	+30	-36
B. D.+18°, 624	6.0	1.26	1.5	18 31.2	21 58.3	+ 4 13.9	-1.2517	0.5369	0.1304	-48	-71
$\delta^1$ Tauri	3.9	1.24	1.8	17 19.5	23 12.8	+ 5 26.0	+0.2147	0.5371	0.1286	+50	-16
63 Tauri	5.7	1.23	2.1	16 33.7	23 27.6	+ 5 40.4	+1.0815	0.5371	0.1282	+90	+36
$\delta^2$ Tauri	4.9	+1.24	+1.8	+17 13.8	23 46.6	+ 5 58.7	+0.3918	0.5372	+0.1277	+63	- 7
B. A. C. 1361	6.0	1.25	1.2	18 49.7	30 0 9.8	+ 6 21.2	-1.3071	0.5372	0.1271	-66	-71
$\delta^3$ Tauri	4.3	1.23	1.6	17 43.0	0 26.6	+ 6 37.6	-0.0553	0.5372	0.1267	+35	-31
$\epsilon$ Tauri	3.6	1.23	1.1	18 58.5	1 56.1	+ 8 4.2	-1.2451	0.5375	0.1244	-47	-71
B. D.+17°, 75c	6.2	1.19	1.3	17 49.3	4 20.7	+10 24.2	+0.3126	0.5378	0.1207	+57	-10
Mayer 177	6.1	+1.13	+0.7	+18 34.0	10 28.1	- 7 40.1	+0.2055	0.5387	+0.1110	+50	-15
$\epsilon$ Tauri	5.2	1.10	0.5	18 40.9	12 55.3	- 5 17.7	+0.3465	0.5391	0.1071	+59	- 7
B. D.+19°, 811	6.2	1.10	+0.2	19 20.1	14 38.2	- 3 37.9	-0.1887	0.5394	0.1043	+27	-36
Mayer 198	6.3	1.04	-0.2	19 40.7	19 42.0	+ 1 16.1	-0.0599	0.5402	0.0959	+34	-28
$\zeta$ Tauri	5.2	1.03	0.5	20 17.8	20 46.8	+ 2 18.9	-0.6362	0.5404	0.0941	+ 2	-64
107 Tauri	6.5	+1.02	-0.3	+19 44.4	21 16.9	+ 2 48.0	+0.0231	0.5404	+0.0933	+39	-23
B. A. C. 1639	6.2	0.97	0.7	20 2.2	31 2 15.3	+ 7 36.8	+0.1379	0.5412	0.0848	+46	-16
B. A. C. 1651	6.5	0.96	0.7	19 43.2	3 4.2	+ 8 24.1	+0.5558	0.5413	0.0834	+77	+ 7
Piazzi v, 125	6.1	0.90	1.2	20 24.5	9 6.7	- 9 45.0	+0.2696	0.5422	0.0728	+54	- 7
$\zeta$ Tauri	3.0	0.88	1.6	21 5.2	11 0.0	- 7 55.4	-0.3439	0.5425	0.0695	+18	-41
$\chi^1$ Orionis	4.5	+0.78	-1.7	+20 15.5	18 58.3	- 0 12.6	+1.0671	0.5436	+0.0551	+90	+43
141 Tauri	6.3	0.77	2.5	22 23.9	22 22.9	+ 3 5.4	-1.1216	0.5440	0.0489	-35	-68

## SEPTEMBER.

B. A. C. 1970	6.0	+0.73	-2.6	+22 12.3	1 2 5.9	+ 6 41.1	-0.7386	0.5445	+0.0420	- 5	-68
$\eta$ Geminorum	3.5	0.70	2.8	22 32.0	4 37.0	+ 9 7.3	-1.0029	0.5448	0.0374	-24	-67
$\mu$ Geminorum	3.2	0.66	3.0	22 33.7	8 25.6	-11 11.5	-0.9049	0.5451	0.0303	-16	-67
15 Geminorum	6.5	0.63	2.5	20 50.8	10 44.2	- 8 57.4	+1.0595	0.5453	0.0259	+90	+46
$\delta$ Geminorum	5.2	0.52	3.1	21 52.2	21 55.1	+ 1 51.5	+0.0973	0.5461	+0.0048	+44	-10
44 Geminorum	5.9	+0.46	-3.5	+22 46.6	2 4 22.5	+ 8 6.3	-0.9149	0.5464	-0.0074	-17	-67
NEPTUNE				21 52.0	5 19.8	+ 9 1.8	+0.0853	0.5453	0.0091	+43	-11
Lalande 13849	6.5	0.42	3.5	21 24.5	6 40.5	+10 19.8	+0.5787	0.5464	0.0118	+80	+15
$\delta$ Geminorum	3.5	0.38	3.4	22 9.2	11 22.0	- 9 7.9	-0.3226	0.5464	0.0207	+20	-35
B. A. C. 2455	6.4	0.34	3.3	21 43.3	14 33.2	- 6 2.9	+0.0807	0.5465	0.0267	+43	-13
63 Geminorum	5.3	+0.35	-3.4	+21 38.1	14 58.0	- 5 38.9	-0.1647	0.5465	-0.0275	+48	- 8
B. A. C. 2544	6.3	0.28	3.6	22 37.1	22 19.1	+ 1 27.8	-1.1768	0.5462	0.0413	-41	-67
79 Geminorum	6.3	0.28	3.1	20 32.3	23 11.8	+ 2 18.7	+1.0882	0.5462	0.0430	+90	+46
B. D.+20°, 1976	6.3	0.21	3.0	20 4.2	3 6 35.9	+ 9 28.3	+1.2365	0.5457	0.0567	+90	+59
$\mu^2$ Cancri	5.5	0.19	3.5	21 51.1	9 52.0	-11 22.0	-0.9274	0.5454	0.0626	-18	-68
Piazzi viii, 42	6.0	+0.14	-3.3	+21 2.4	15 51.1	- 5 34.5	-0.4383	0.5449	-0.0735	+13	-48
JUPITER				19 43.9	19 46.1	- 1 47.2	+0.7053	0.5358	0.0784	+90	+16
$\eta$ Cancri	5.4	0.09	3.1	20 45.4	21 44.6	+ 0 7.6	-0.5879	0.5442	0.0839	+ 5	-60
39 Cancri	6.5	0.07	2.9	20 20.1	4 1 16.7	+ 3 32.8	-0.4309	0.5438	0.0901	+14	-49
40 Cancri	6.5	0.07	2.9	20 18.0	1 19.2	+ 3 35.3	-0.3945	0.5438	0.0901	+16	-47
B. A. C. 2919	6.5	+0.07	-2.9	+19 59.9	1 24.5	+ 3 40.4	-0.0706	0.5438	-0.0903	+34	-27

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.											
SEPTEMBER.											
THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
$\epsilon$ Cancr	6.3	+0.07	-2.9	+19 52.4	4 1 27.0	+3 42.8	+0.0635	0.5438	-0.0904	+42	-20
B. A. C. 2991	6.1	+0.04	2.6	19 10.7	6 23.2	+8 29.4	+0.3618	0.5431	0.0988	+61	-5
B. A. C. 3209	6.3	-0.05	-2.0	+16 59.2	23 10.6	+0 44.7	+0.8798	0.5404	0.1259	+90	+22
NEW MOON.											
80 Virginis	5.6	+0.16	+1.2	-4 55.3	10 3 17.0	+1 1.1	+0.9531	0.5370	-0.2136	+85	+16
Piazzii xiii, 174	6.4	0.18	1.2	5 1.8	7 22.1	+4 58.5	+0.1956	0.5383	0.2124	+48	-27
$\eta$ Virginis	6.5	0.21	1.0	6 22.4	9 29.4	+7 1.9	+1.1555	0.5389	0.2116	+84	+31
Lalande 26147	6.5	0.33	1.2	7 6.4	23 43.2	+3 11.7	-1.0413	0.5442	0.2043	-24	-90
$\zeta$ Libræ	5.7	0.50	1.0	11 31.1	11 16 41.7	-10 46.5	+0.1959	0.5520	0.1907	+45	-26
$\zeta$ Libræ	5.7	+0.51	+1.2	-11 2.1	17 47.7	-9 42.8	-0.5162	0.5526	-0.1896	+6	-71
17 Libræ	6.4	0.52	1.3	10 46.9	18 28.1	-9 3.8	-0.9060	0.5529	0.1889	-17	-90
18 Libræ	5.9	0.52	1.2	10 46.2	18 46.8	-8 45.7	-0.9762	0.5531	0.1886	-22	-90
$\gamma$ Libræ	4.1	0.73	1.0	14 28.8	12 11 14.9	+7 8.6	-0.0899	0.5621	0.1692	+26	-43
Bradley 1987	6.5	0.76	1.1	14 44.7	14 44.0	+10 30.4	-0.3972	0.5641	0.1644	+10	-63
$\eta$ Libræ	5.5	+0.77	+0.9	-15 22.6	15 1.0	+10 46.8	+0.2072	0.5643	-0.1640	+43	-25
$\theta$ Libræ	4.4	0.84	1.0	16 27.4	19 16.0	-9 7.1	+0.6343	0.5667	0.1578	+69	-3
49 Libræ	5.4	0.83	0.8	16 15.6	22 7.8	-6 21.5	-0.0145	0.5684	0.1535	+29	-39
B.D.-17°, 4502	6.4	0.92	0.8	18 5.6	18 2 13.0	-2 25.0	+1.2545	0.5709	0.1470	+72	+47
B. A. C. 5408	6.4	0.94	0.8	18 17.8	4 14.6	-0 27.8	+1.1683	0.5721	0.1436	+72	+37
$\chi$ Ophiuchi	4.9	+1.02	+1.2	-18 14.7	9 30.3	+4 36.5	+0.3821	0.5752	-0.1345	+50	-17
24 Scorpii	5.0	1.09	1.9	17 33.7	15 38.1	+10 30.7	-1.1067	0.5787	0.1232	-40	-90
Bradley 2115	5.5	1.12	1.1	19 44.8	15 44.0	+10 36.4	+1.1137	0.5788	0.1231	+70	+32
Mayer 679	5.9	1.18	1.2	20 15.6	20 31.3	-8 47.0	+1.0698	0.5815	0.1137	+70	+28
B. A. C. 5700	6.1	1.20	1.7	19 23.6	22 2.5	-7 19.3	+0.0138	0.5823	0.1107	+26	-37
29 Ophiuchi	6.4	+1.22	+2.1	-18 44.9	14 0 1.6	-5 24.7	-0.8587	0.5834	-0.1067	-23	-90
B. A. C. 5746	6.2	1.23	1.6	20 21.8	1 11.4	-4 17.6	+0.6650	0.5841	0.1043	+67	0
$\zeta$ Ophiuchi	4.4	1.36	1.8	21 0.8	7 47.9	+2 3.8	+0.6810	0.5875	0.0904	+67	+1
B. A. C. 5866	5.9	1.37	1.9	21 21.3	9 18.1	+3 30.5	+0.8952	0.5883	0.0871	+69	+15
52 Ophiuchi	6.4	1.43	2.1	21 58.8	13 34.1	+7 36.7	+1.1786	0.5903	0.0776	+68	+41
58 Ophiuchi	4.8	+1.47	+2.5	-21 38.3	16 50.0	+10 45.0	+0.5883	0.5918	-0.0701	+58	-4
B. A. C. 6081	6.4	1.55	3.6	20 19.9	23 26.9	-6 53.6	-1.1481	0.5945	0.0546	-51	-90
B. A. C. 6125	6.2	1.60	3.4	21 27.2	15 2 16.5	-4 10.7	-0.1576	0.5955	0.0479	+10	-48
$\mu$ Sagittarii	4.1	1.63	3.8	21 5.0	4 52.4	-1 41.0	-0.6480	0.5965	0.0416	-17	-88
14 Sagittarii	5.6	1.64	3.6	21 44.2	5 3.7	-1 30.2	+0.0065	0.5965	0.0411	+19	-37
15 Sagittarii	5.3	+1.64	+3.9	-20 45.3	5 27.1	-1 7.7	-1.0028	0.5967	-0.0402	-39	-90
Bradley 2332	5.7	1.76	4.6	21 28.4	14 20.2	+7 24.2	-0.5346	0.5992	0.0182	-12	-75
B. A. C. 6347	5.9	1.76	4.7	21 7.7	14 43.8	+7 46.8	-0.8908	0.5993	0.0172	-34	-90
B.D.-21°, 5131	6.3	1.80	5.0	21 5.7	17 14.0	+10 11.0	-0.9584	0.5997	0.0109	-39	-90
28 Sagittarii	5.6	1.82	4.6	22 29.3	17 36.8	+10 32.9	+0.4431	0.5998	0.0099	+42	-13
30 Sagittarii	6.2	+1.84	+4.8	-22 16.1	19 22.3	-11 45.8	+0.2066	0.6002	-0.0055	+27	-26
33 Sagittarii	5.8	1.84	5.3	21 28.4	20 36.8	-10 34.3	-0.5997	0.6004	0.0023	-17	-82
$\nu$ Sagittarii	5.0	1.86	4.8	22 51.5	20 39.4	-10 31.8	+0.7971	0.6004	0.0022	+67	+9
$\nu$ Sagittarii	5.1	1.87	4.9	22 47.2	21 1.4	-10 10.7	+0.7239	0.6004	0.0013	+67	+4
Piazzii xviii, 225	5.9	1.87	4.7	23 17.5	21 22.0	-9 50.9	+1.2323	0.6005	-0.0004	+67	+50
$\zeta$ Sagittarii	3.7	+1.86	+5.5	-21 13.7	22 4.0	-9 10.6	-0.8468	0.6005	+0.0013	-32	-90
B. A. C. 6485	6.3	1.89	5.1	22 49.5	23 33.6	-7 44.6	+0.7674	0.6008	0.0051	+67	+7
$\theta$ Sagittarii	3.9	1.90	5.5	21 52.6	16 0 45.5	-6 35.5	-0.1802	0.6009	0.0082	+6	-49
$\pi$ Sagittarii	3.0	1.91	6.0	21 10.2	2 44.9	-4 40.9	-0.8700	0.6011	0.0132	-33	-90
B. A. C. 6561	6.4	1.93	5.9	21 48.7	3 47.2	-3 41.1	-0.2093	0.6012	0.0159	+5	-51
Piazzii xix, 61	5.5	+1.98	+6.0	-22 34.5	6 57.0	-0 39.0	+0.6210	0.6014	+0.0239	+57	-2
50 Sagittarii	5.5	2.00	6.4	21 57.0	9 9.9	+1 28.6	+0.0616	0.6014	0.0295	+21	-34
B. A. C. 6671	6.1	2.01	6.8	21 30.2	10 57.1	+3 11.5	-0.3394	0.6015	0.0340	-1	-59
B.D.-18°, 5783	6.4	2.27	10.8	18 22.6	17 42.9	+8 43.6	-1.2667	0.5956	0.1080	-60	-90
19 Capricorni	5.7	2.28	11.0	18 16.4	19 53.2	+10 48.8	-1.1304	0.5949	0.1128	-43	-90
20 Capricorni	6.2	+2.31	+10.9	-19 23.6	21 47.3	-11 21.6	+0.2110	0.5941	+0.1169	+37	-26



## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		Δα	Δδ										
		s	"	°	d h m	h m				°	°		
21 Capricorni	6.5	+2.30	+11.3	-17 53.4	17 22 18.6	-10 51.5	-1.2338	0.5939	+0.1180	-54	-90		
7 Capricorni	4.8	2.33	10.8	20 13.2	23 42.0	-9 31.4	+1.2675	0.5934	0.1210	+70	+57		
8 Capricorni	4.1	2.32	11.5	17 36.0	18 0 20.5	-8 54.3	-1.2813	0.5932	0.1223	-62	-90		
B.D.-17°, 6216	6.1	2.34	11.9	17 43.6	4 1.5	-5 21.8	-0.6893	0.5917	0.1298	-11	-90		
30 Capricorni	5.4	2.35	11.8	18 22.3	5 9.9	-4 16.2	+0.1070	0.5912	0.1323	+33	-32		
31 Capricorni	6.3	+2.35	+11.9	-17 51.0	5 17.6	-4 8.7	-0.3999	0.5911	+0.1326	+5	-63		
Capricorni	4.3	2.35	12.2	17 13.7	6 54.6	-2 35.5	-0.8064	0.5904	0.1358	-17	-90		
Capricorni	3.7	2.40	12.8	17 4.7	14 10.0	+4 23.2	+0.0809	0.5870	0.1496	+33	-30		
Capricorni	2.9	2.41	12.9	16 32.8	17 1.2	+7 8.0	-0.0193	0.5857	0.1548	+28	-39		
B.D.-17°, 6389	6.5	2.41	13.0	17 16.5	18 20.0	+8 23.8	+0.9174	0.5850	0.1571	+73	+15		
Aquarii	4.4	+2.42	+14.0	-14 19.0	19 1 5.1	-9 6.4	-0.9527	0.5816	+0.1684	-23	-90		
39 Aquarii	6.2	2.43	14.1	14 38.9	3 35.4	-6 41.7	-0.1937	0.5803	0.1723	+21	-49		
42 Aquarii	5.5	2.43	14.5	13 17.5	5 26.3	-4 54.9	-1.2364	0.5793	0.1751	-47	-90		
45 Aquarii	6.1	2.44	14.4	13 46.0	6 21.7	-4 1.6	-0.5962	0.5789	0.1765	0	-79		
50 Aquarii	5.9	2.45	14.5	13 59.8	8 39.5	-1 48.8	+0.0443	0.5777	0.1798	+35	-35		
Bradley 2961	6.2	+2.46	+14.7	-13 23.3	11 1.3	+0 27.8	-0.1397	0.5764	+0.1831	+25	-46		
70 Aquarii	6.1	2.46	15.4	11 2.5	18 57.2	+8 6.4	-1.0084	0.5722	0.1932	-24	-90		
74 Aquarii	5.8	2.46	15.3	12 6.4	21 6.0	+10 10.7	+0.4817	0.5711	0.1957	+63	-12		
♊ Aquarii	4.5	2.50	15.8	9 35.4	20 6 53.3	-4 22.9	-0.0934	0.5661	0.2056	+30	-43		
♋ Aquarii	4.6	2.47	15.9	9 41.2	7 47.5	-3 30.5	+0.1896	0.5656	0.2064	+46	-27		
♌ Aquarii	5.2	+2.47	+15.8	-10 6.9	8 15.4	-3 3.6	+0.7197	0.5654	+0.2068	+80	+1		
B.D.-10°, 6120	6.3	2.47	16.0	9 46.4	12 43.3	+1 15.0	+1.3068	0.5632	0.2104	+80	+50		
B. A. C. 8214	6.5	2.47	16.1	7 58.5	15 38.2	+4 3.8	+0.1007	0.5618	0.2125	+42	-32		
Mayer 1012	6.3	2.47	16.1	6 53.5	21 29.3	+9 42.8	+0.2565	0.5591	0.2161	+51	-24		
30 Piscium	4.7	2.46	16.1	6 31.6	21 3 34.7	-8 24.2	+1.2114	0.5564	0.2190	+83	+36		
33 Piscium	4.7	+2.46	+16.2	-6 13.4	5 7.4	-6 54.7	+1.2421	0.5557	+0.2196	+84	+40		
Piazzi o, i	6.0	2.46	16.1	5 45.6	7 24.1	-4 42.6	+1.2727	0.5548	0.2204	+84	+43		
B. A. C. 81	6.3	2.45	15.9	2 43.7	13 56.1	+1 36.3	-0.3775	0.5523	0.2221	+17	-61		
14 Ceti	5.4	2.46	15.7	-1 0.7	19 3.3	+6 33.3	-0.9993	0.5504	0.2228	-19	-90		
26 Ceti	6.0	2.44	15.1	+0 52.4	22 8 18.6	-4 37.5	+0.0098	0.5463	0.2220	+39	-37		
33 Ceti	6.1	+2.42	+14.9	+1 57.3	11 30.0	-1 32.3	-0.4018	0.5455	+0.2213	+17	-62		
f Piscium	5.1	2.42	14.6	3 7.7	14 55.8	+1 46.9	-0.8608	0.5447	0.2203	-10	-87		
Lalande 2632	6.5	2.41	14.4	3 3.4	19 15.2	+5 57.9	+0.1619	0.5437	0.2187	+47	-29		
v Piscium	4.6	2.39	13.7	5 1.3	23 2 11.1	-11 19.5	-0.3763	0.5423	0.2155	+18	-60		
Piazzi i, 249	6.5	2.37	12.6	7 17.6	13 23.9	-0 28.3	-0.3748	0.5408	0.2085	+18	-59		
64 Ceti	5.8	+2.35	+12.1	+8 8.3	16 31.6	+2 33.4	-0.6140	0.5405	+0.2062	+5	-76		
♎ Ceti	4.5	2.36	12.1	8 24.8	17 18.7	+3 19.0	-0.7426	0.5404	0.2056	-3	-80		
25 Arietis	6.5	2.32	11.1	9 47.3	24 0 14.5	+10 1.5	-0.7881	0.5398	0.1998	-5	-80		
♏ Ceti	4.5	2.32	11.6	8 2.8	0 36.8	+10 23.1	+1.1246	0.5398	0.1995	+90	+31		
B. F. 310	6.3	2.33	11.3	9 9.2	1 17.6	+11 2.6	+0.0917	0.5398	0.1989	+43	-30		
85 Ceti	6.3	+2.30	+10.5	+10 20.9	7 29.9	-6 56.9	+0.0442	0.5395	+0.1930	+40	-32		
♐ Ceti	4.3	2.30	10.6	9 43.5	8 40.6	-5 48.5	+0.9322	0.5395	0.1918	+90	+18		
W. B. ii, 1033	5.8	2.26	8.9	12 49.9	18 59.6	+4 10.9	-0.4470	0.5395	0.1806	+14	-60		
Mayer 121	6.4	2.19	6.8	15 7.7	25 10 3.9	-5 13.5	-0.3236	0.5401	0.1617	+20	-50		
Mayer 136	5.9	2.16	5.6	17 3.1	17 24.0	+1 52.5	-1.2487	0.5406	0.1516	-45	-73		
B. A. C. 1239	6.3	+2.12	+5.2	+17 2.1	20 58.3	+5 19.9	-0.7005	0.5409	+0.1464	-1	-73		
Piazzi iii, 249	6.1	2.10	4.8	17 5.6	26 0 29.8	+8 44.5	-0.2562	0.5411	0.1412	+24	-42		
B.D.+16°, 569	6.2	2.08	4.6	17 2.4	2 39.5	+10 50.1	+0.1028	0.5413	0.1378	+44	-23		
B.D.+18°, 624	6.0	2.07	3.8	18 31.3	6 23.8	-9 32.7	-0.9990	0.5416	0.1321	-21	-71		
♈ Tauri	3.9	2.04	4.0	17 19.6	7 37.0	-8 21.9	+0.4581	0.5418	0.1302	+68	-3		
♉ Tauri	4.9	+2.04	+4.0	+17 13.8	8 10.3	-7 49.8	+0.6343	0.5417	+0.1294	+85	+6		
B. A. C. 1361	6.0	2.05	3.5	18 49.8	8 33.1	-7 27.7	-1.0531	0.5419	0.1288	-26	-71		
♊ Tauri	4.3	2.04	3.8	17 43.0	8 49.6	-7 11.6	+0.1905	0.5419	0.1283	+49	-17		
♋ Tauri	3.6	2.04	3.3	18 58.5	10 17.6	-5 46.5	-0.9907	0.5420	0.1260	-21	-71		
B.D.+17°, 750	6.2	2.00	3.4	17 49.3	12 39.9	-3 28.8	+0.5577	0.5422	0.1222	+77	+3		
Mayer 177	6.1	+1.95	+2.5	+18 34.1	18 41.7	+2 21.3	+0.4536	0.5428	+0.1123	+68	-2		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.											
SEPTEMBER.											
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ' "	d h m	h m				°	' "
<i>i</i> Tauri	5.2	+1.93	+2.3	+18 41.0	26 21 6.5	+ 4 41.4	+0.5945	0.5430	+0.1082	+81	+ 7
B.D.+19°, 811	6.2	1.92	1.9	19 20.1	22 48.2	+ 6 19.8	+0.0630	0.5432	0.1053	+42	-22
Mayer 198	6.3	1.87	1.3	19 40.8	27 3 47.8	+11 9.6	+0.1920	0.5436	0.0967	+50	-14
<i>l</i> Tauri	5.2	1.87	1.0	20 17.8	4 51.7	-11 48.5	-0.3809	0.5437	0.0949	+17	-46
107 Tauri	6.5	1.86	1.2	19 44.4	5 21.4	-11 19.8	+0.2748	0.5438	0.0940	+55	-10
B. A. C. 1639	6.2	+1.81	+0.6	+20 2.3	10 16.0	- 6 34.8	+0.3895	0.5442	+0.0853	+63	- 2
B. A. C. 1651	6.5	1.80	+0.6	19 43.3	11 4.4	- 5 48.0	+0.8052	0.5443	0.0839	+90	+21
Piazzi v, 125	6.1	1.74	-0.2	20 24.5	17 2.7	- 0 1.3	+0.5207	0.5447	0.0731	+73	+ 6
$\zeta$ Tauri	3.0	1.73	0.6	21 5.2	18 54.8	+ 4 47.1	-0.0900	0.5448	0.0697	+33	-26
141 Tauri	6.3	1.62	2.0	22 23.9	28 6 11.4	-11 18.4	-0.8665	0.5455	0.0488	-13	-68
B. A. C. 1970	6.0	+1.58	-2.3	+22 12.3	9 52.7	- 7 44.4	-0.4861	0.5456	+0.0419	+10	-48
6 Geminorum	6.3	1.57	2.6	22 55.8	11 10.0	- 6 29.6	-1.2330	0.5457	0.0394	-50	-67
$\eta$ Geminorum	3.5	1.55	2.6	22 32.0	12 22.7	- 5 19.3	-0.7503	0.5457	0.0371	- 6	-67
$\mu$ Geminorum	3.2	1.51	3.0	22 33.7	16 9.8	- 1 39.6	-0.6541	0.5458	0.0300	+ 1	-61
<i>d</i> Geminorum	5.2	1.34	3.6	21 52.2	29 5 35.6	+11 19.7	+0.3386	0.5458	+0.0042	+60	+ 3
44 Geminorum	5.9	+1.27	-4.3	+22 46.6	12 2.0	- 6 26.5	-0.6753	0.5456	-0.0081	- 1	-62
NEPTUNE				21 48.5	13 56.8	- 4 35.5	+0.3770	0.5450	0.0116	+62	+ 4
Lalande 13849	6.5	1.22	4.3	21 24.5	14 19.7	- 4 13.3	+0.8140	0.5455	0.0125	+90	+29
$\delta$ Geminorum	3.5	1.18	4.5	22 9.2	19 0.8	+ 0 18.5	-0.0801	0.5452	0.0214	+33	-22
58 Geminorum	6.0	1.16	4.9	23 7.4	20 34.2	+ 1 48.9	-1.1983	0.5451	0.0244	-44	-67
B. A. C. 2455	6.4	+1.12	-4.5	+21 43.2	22 11.9	+ 3 23.3	+0.3111	0.5450	-0.0275	+58	- 1
63 Geminorum	5.3	1.13	4.6	21 38.1	22 36.7	+ 3 47.4	+0.3947	0.5451	0.0282	+64	+ 4
B. A. C. 2544	6.3	1.04	5.2	22 37.1	30 5 57.9	+10 54.3	-0.9513	0.5444	0.0421	-20	-67
$\mu$ Cancri	5.5	0.91	5.4	21 51.0	17 31.8	- 1 54.4	-0.7136	0.5432	0.0635	- 3	-67
Piazzi viii, 42	6.0	+0.84	-5.3	+21 2.4	23 31.6	+ 3 53.8	-0.2315	0.5425	-0.0743	+25	-35
OCTOBER.											
$\eta$ Cancri	5.4	+0.77	-5.3	+20 45.4	1 5 26.1	+ 9 37.8	-0.3882	0.5417	-0.0848	+15	-46
39 Cancri	6.5	0.73	5.3	20 20.1	8 58.9	-10 57.3	-0.2355	0.5412	0.0910	+25	-37
40 Cancri	6.5	+0.73	-5.2	+20 17.9	9 1.4	-10 54.9	-0.1992	0.5412	-0.0910	+27	-35
B. A. C. 2919	6.5	0.72	5.2	19 59.9	9 6.7	-10 49.7	+0.1244	0.5412	0.0912	+45	-17
$\epsilon$ Cancri	6.3	0.73	5.1	19 52.4	9 9.2	-10 47.3	+0.2584	0.5412	0.0913	+54	-10
B. A. C. 2991	6.1	0.67	5.0	19 10.7	14 6.3	- 5 59.8	+0.5501	0.5405	0.0997	+76	+ 5
B. A. C. 3209	6.3	0.50	4.5	16 59.2	2 6 56.9	+10 18.7	+1.0429	0.5379	0.1270	+90	+33
8 Leonis	5.9	+0.45	-4.5	+16 51.2	12 32.6	- 8 16.1	+0.4522	0.5370	-0.1355	+67	- 4
B.D.+16°, 2077	6.3	0.33	4.2	16 12.6	3 2 34.8	+ 5 19.6	-0.8866	0.5351	0.1553	-13	-74
34 Leonis	6.4	0.32	3.6	13 48.8	5 31.6	+ 8 10.9	+1.2585	0.5347	0.1592	+90	+50
37 Leonis	5.5	0.29	3.6	14 11.5	8 0.7	+10 35.3	+0.4472	0.5343	0.1624	+67	- 8
42 Leonis	6.1	0.27	3.9	15 26.6	10 32.9	-10 57.2	-1.3295	0.5340	0.1656	-63	-75
<i>i</i> Leonis	5.8	+0.23	-3.6	+14 36.8	15 40.7	- 5 58.9	-1.2923	0.5334	-0.1718	-50	-75
<i>l</i> Leonis	5.3	0.19	-2.7	+11 2.2	4 0 9.8	+ 2 14.3	+1.0810	0.5328	0.1814	+90	+29
NEW MOON.											
$\xi$ Libræ	5.7	0.24	+1.4	-11 31.1	8 22 56.0	- 2 44.8	+0.0154	0.5579	0.1946	+35	-37
$\xi^a$ Libræ	5.7	+0.25	+1.6	-11 2.1	9 0 0.8	- 1 42.2	-0.6930	0.5584	-0.1935	- 3	-90
17 Libræ	6.4	0.25	1.6	10 46.9	0 40.3	- 1 4.1	-1.0809	0.5588	0.1928	-29	-90
18 Libræ	5.9	0.24	1.6	10 46.2	0 58.7	- 0 46.3	-1.1510	0.5589	0.1925	-35	-90
$\gamma$ Libræ	4.1	0.39	1.7	14 28.8	17 9.1	- 9 9.7	-0.2966	0.5675	0.1725	+16	-56
Bradley 1987	6.5	0.41	1.7	14 44.7	20 34.7	- 5 51.4	-0.6067	0.5693	0.1675	- 2	-81
$\eta$ Libræ	5.5	+0.42	+1.6	-15 22.6	20 51.4	- 5 35.3	-0.0064	0.5695	-0.1671	+30	-39
$\theta$ Libræ	4.4	0.46	1.8	16 27.4	10 1 2.4	- 1 33.3	+0.4130	0.5717	0.1607	+54	-15
49 Libræ	5.4	0.45	1.4	16 15.6	3 51.6	+ 1 9.7	-0.2354	0.5732	0.1562	+17	-52
B.D.-17°, 4502	6.4	0.53	1.5	18 5.6	7 53.3	+ 5 2.6	+1.0228	0.5753	0.1494	+72	+23
B. A. C. 5408	6.4	0.55	1.4	18 17.8	9 53.2	+ 6 58.1	+0.9351	0.5764	0.1459	+72	+16
$\chi$ Ophiuchi	4.9	+0.60	+1.8	-18 14.7	15 4.9	+11 58.4	+0.1478	0.5791	-0.1366	+36	-30

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
Bradley 2115	5.5	+0.68	+ 1.7	-19 44.8	10 21 14.4	- 6 5.9	+0.8720	0.5821	-0.1248	+70	+12
Mayer 679	5.9	0.73	1.8	20 15.6	11 1 58.9	- 1 32.2	+0.8253	0.5843	0.1152	+70	+ 9
B. A. C. 5700	6.1	0.74	2.1	19 23.5	3 29.3	- 0 5.2	-0.2291	0.5852	0.1121	+13	-52
29 Ophiuchi	6.4	0.76	2.4	18 44.9	5 27.4	+ 1 48.4	-1.1009	0.5859	0.1080	-41	-90
B. A. C. 5746	6.2	0.79	2.0	20 21.8	6 36.8	+ 2 55.1	+0.4190	0.5864	0.1056	+49	-15
$\xi$ Ophiuchi	4.4	+0.88	+ 2.1	-21 0.8	13 10.8	+ 9 14.1	+0.4320	0.5891	-0.0913	+48	-14
B. A. C. 5866	5.9	0.89	2.2	21 21.3	14 40.5	+10 40.2	+0.6455	0.5897	0.0879	+64	- 2
52 Ophiuchi	6.4	0.95	2.3	21 58.8	18 55.5	- 9 14.6	+0.9279	0.5912	0.0782	+68	+17
58 Ophiuchi	4.8	0.98	2.5	21 38.3	22 11.0	- 6 6.8	+0.3370	0.5922	0.0706	+40	-19
B. A. C. 6088	5.7	1.09	2.7	22 46.7	12 5 30.6	+ 0 55.7	+1.0391	0.5943	0.0532	+67	+26
B. A. C. 6125	6.2	+1.10	+ 3.3	-21 27.2	7 37.5	+ 2 57.7	-0.4119	0.5948	-0.0480	- 3	-65
$\mu$ Sagittarii	4.1	1.13	3.6	21 5.0	10 13.8	+ 5 27.8	-0.9041	0.5953	0.0417	-32	-90
14 Sagittarii	5.6	1.14	3.4	21 44.2	10 25.1	+ 5 38.6	-0.2479	0.5953	0.0412	+ 5	-53
15 Sagittarii	5.3	1.14	3.7	20 45.3	10 48.5	+ 6 1.1	-1.2599	0.5954	0.0402	-65	-90
Bradley 2332	5.7	1.26	4.1	21 28.4	19 44.3	- 9 24.4	-0.7910	0.5967	0.0181	-27	-90
B. A. C. 6347	5.9	+1.26	+ 4.2	-21 7.7	20 8.0	- 9 1.6	-1.1488	0.5967	-0.0171	-54	-90
URANUS				23 30.5	22 26.7	- 6 48.3	+1.2309	0.5961	0.0113	+67	+50
B.D.-21°, 5131	6.3	1.30	4.4	21 5.7	22 39.2	- 6 36.4	-1.2170	0.5969	0.0107	-61	-90
28 Sagittarii	5.6	1.32	4.0	22 29.3	23 2.2	- 6 14.3	+0.1914	0.5969	0.0098	+26	-27
30 Sagittarii	6.2	1.33	4.2	22 16.1	18 0 48.6	- 4 32.2	-0.0459	0.5970	0.0054	+13	-41
33 Sagittarii	5.8	+1.34	+ 4.6	-21 28.4	2 3.8	- 3 20.0	-0.8561	0.5970	-0.0021	-33	-90
$\nu$ Sagittarii	5.0	1.36	4.1	22 51.5	2 6.4	- 3 17.5	+0.5480	0.5970	0.0020	+50	- 7
$\nu$ Sagittarii	5.1	1.37	4.1	22 47.2	2 28.6	- 2 56.1	+0.4746	0.5970	0.0011	+44	-11
Piazzixviii, 225	5.9	1.37	4.0	23 17.5	2 49.4	- 2 36.1	+0.9858	0.5971	-0.0002	+67	+22
$\zeta$ Sagittarii	3.7	1.36	4.8	21 13.7	3 31.8	- 1 55.4	-1.1044	0.5971	+0.0015	-51	-90
B. A. C. 6485	6.3	+1.40	+ 4.4	-22 49.5	5 2.3	- 0 28.5	+0.5192	0.5971	+0.0054	+47	- 9
$\sigma$ Sagittarii	3.9	1.41	4.8	21 52.6	6 15.0	+ 0 41.3	-0.4335	0.5971	0.0084	- 8	-67
Lalande 35745	6.5	1.44	4.4	23 20.2	7 49.4	+ 2 12.0	+1.0610	0.5970	0.0123	+67	+29
$\pi$ Sagittarii	3.0	1.42	5.2	21 10.2	8 15.6	+ 2 37.1	-1.1270	0.5970	0.0135	-52	-90
B. A. C. 6561	6.4	1.44	5.0	21 48.7	9 18.7	+ 3 37.7	-0.4619	0.5969	0.0161	- 9	-69
Piazzixix, 61	5.5	+1.49	+ 5.0	-22 34.5	12 30.8	+ 6 42.2	+0.3752	0.5967	+0.0241	+39	-17
50 Sagittarii	5.5	1.52	5.4	21 57.6	14 45.5	+ 8 51.5	-0.1871	0.5964	0.0297	+ 7	-50
B. A. C. 6671	6.1	1.54	5.7	21 30.3	16 34.3	+10 36.0	-0.5902	0.5962	0.0342	-14	-81
4 Capricorni	5.7	1.78	7.0	22 5.7	14 11 15.4	+ 4 33.0	+1.0754	0.5919	0.0794	+68	+29
20 Capricorni	6.2	1.94	9.2	19 23.6	15 4 6.5	- 3 14.9	-0.0055	0.5856	0.1166	+25	-39
$\eta$ Capricorni	4.8	+1.97	+ 9.0	-20 13.2	6 4.2	- 1 21.6	+1.0658	0.5847	+0.1206	+70	+27
B.D.-17°, 6216	6.1	2.00	10.2	17 43.6	10 30.4	+ 2 54.5	-0.9084	0.5827	0.1295	-24	-90
30 Capricorni	5.4	2.02	10.0	18 22.3	11 40.5	+ 4 1.9	-0.1010	0.5822	0.1318	+22	-44
31 Capricorni	6.3	2.02	10.2	17 51.0	11 48.4	+ 4 9.5	-0.6138	0.5821	0.1321	- 6	-83
$\iota$ Capricorni	4.3	2.03	10.5	17 13.7	13 28.0	+ 5 45.4	-1.0229	0.5813	0.1352	-32	-90
$\gamma$ Capricorni	3.7	+2.11	+11.0	-17 4.8	20 55.2	-11 4.1	-0.1141	0.5778	+0.1490	+23	-45
$\delta$ Capricorni	2.9	2.13	11.2	16 32.8	23 51.2	- 8 14.5	-0.2110	0.5763	0.1541	+18	-51
B.D.-17°, 6389	6.5	2.14	11.2	17 16.6	1 12.1	- 6 56.5	+0.7395	0.5756	0.1564	+72	+ 3
$\epsilon$ Aquarii	4.4	2.18	12.4	14 19.1	8 8.7	- 0 15.2	-1.1423	0.5723	0.1676	-38	-90
39 Aquarii	6.2	2.21	12.4	14 38.9	10 43.2	+ 2 13.8	-0.3691	0.5710	0.1715	+12	-61
45 Aquarii	6.1	+2.23	+12.8	-13 46.0	13 34.3	+ 4 58.7	-0.7714	0.5695	+0.1757	-10	-90
50 Aquarii	5.9	2.24	13.0	13 59.8	15 56.0	+ 7 15.4	-0.1185	0.5683	0.1790	+26	-45
Bradley 2961	6.2	2.27	13.2	13 23.3	18 21.8	+ 9 36.0	-0.3001	0.5672	0.1823	+17	-56
70 Aquarii	6.1	2.31	14.1	11 2.6	17 2 31.1	- 6 32.0	-1.1629	0.5632	0.1924	-36	-90
74 Aquarii	5.8	2.33	13.9	12 6.4	4 43.4	- 4 24.2	+0.3501	0.5622	0.1949	+54	-19
B.D.-11°, 6032	6.3	+2.39	+14.3	-11 11.4	14 14.3	+ 4 46.9	+1.3161	0.5579	+0.2044	+79	+51
$\psi$ Aquarii	4.5	2.41	14.7	9 35.4	14 46.7	+ 5 18.2	-0.2095	0.5577	0.2049	+24	-50
$\psi$ Aquarii	4.6	2.39	14.7	9 41.2	15 42.3	+ 6 12.0	+0.0788	0.5573	0.2058	+40	-34
$\psi$ Aquarii	5.2	2.40	14.6	10 6.9	16 10.9	+ 6 39.6	+0.6163	0.5571	0.2062	+75	- 5
B.D.-10°, 6120	6.3	2.42	14.7	9 46.4	20 45.8	+11 5.2	+1.2205	0.5552	0.2099	+80	+38
B. A. C. 8214	6.5	+2.44	+15.1	- 7 58.5	23 45.0	-10 1.7	+0.0081	0.5540	+0.2121	+37	-38

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.											
OCTOBER.											
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, $H$	$Y$	$x'$	$y'$	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
Mayer 1012	6.3	+2.47	+15.3	- 6 53.6	18 5 44.6	- 4 14.2	+0.1803	0.5518	+0.2159	+47	-28
30 Piscium	4.7	2.50	15.4	6 31.6	11 58.3	+ 1 47.2	+1.1602	0.5497	0.2190	+83	+31
33 Piscium	4.7	2.50	15.7	6 13.4	13 33.0	+ 3 18.7	+1.1950	0.5492	0.2197	+84	+34
Piazzi o. 1	6.0	2.52	15.5	5 45.7	15 52.6	+ 5 33.7	+1.2316	0.5485	0.2205	+84	+38
B. A. C. 81	6.3	2.55	15.7	2 43.7	22 32.5	-11 59.5	-0.4163	0.5466	0.2225	+16	-64
14 Ceti	5.4	+2.57	+15.8	- 1 0.7	19 3 45.3	- 6 56.8	-1.0289	0.5452	+0.2234	-21	-90
26 Ceti	6.0	2.63	15.4	+ 0 52.4	17 12.9	+ 6 4.7	+0.0244	0.5427	0.2231	+39	-37
33 Ceti	6.1	2.64	15.4	1 57.3	20 26.7	+ 9 12.4	-0.3812	0.5421	0.2226	+18	-61
f Piscium	5.1	2.65	15.2	3 7.7	23 54.9	-11 26.1	-0.8331	0.5416	0.2217	- 7	-87
Lalande 2632	6.5	2.66	15.0	3 3.4	20 4 17.0	- 7 12.4	+0.2068	0.5412	0.2203	+50	-27
v Piscium	4.6	+2.69	+14.6	+ 5 1.3	11 16.3	- 0 26.4	-0.3154	0.5406	+0.2174	+21	-56
Piazzi i, 249	6.5	2.72	13.7	7 17.6	22 32.7	+10 28.4	-0.2842	0.5402	0.2108	+23	-53
64 Ceti	5.8	2.73	13.4	8 8.3	21 1 40.9	-10 29.3	-0.5158	0.5402	0.2086	+10	-69
51 Ceti	4.5	2.74	13.4	8 24.9	2 28.1	- 9 43.6	-0.6427	0.5402	0.2080	+ 4	-78
5 Arietis	5.5	2.76	12.8	10 11.6	8 8.8	- 4 13.8	-1.3525	0.5403	0.2035	-61	-80
25 Arietis	6.5	+2.74	+12.5	+ 9 47.4	9 24.4	- 3 0.6	-0.6707	0.5404	+0.2024	+ 2	-79
52 Ceti	4.5	2.74	12.7	8 2.8	9 46.7	- 2 39.0	+1.2453	0.5404	0.2021	+90	+42
B. F. 310	6.3	2.74	12.6	9 9.3	10 27.5	- 1 59.5	+0.2127	0.5404	0.2015	+50	-24
85 Ceti	6.3	2.76	11.9	10 20.9	16 39.3	+ 4 0.5	+0.1798	0.5407	0.1957	+48	-25
μ Ceti	4.3	2.76	11.9	9 43.5	17 49.8	+ 5 8.7	+1.0708	0.5409	0.1945	+90	+28
W. B. ii, 1033	5.8	+2.78	+10.5	+12 49.9	22 4 6.5	- 8 54.2	-0.2856	0.5416	+0.1835	+23	-50
Mayer 121	6.4	2.78	8.4	15 7.7	19 4.6	+ 5 35.0	-0.1315	0.5431	0.1646	+31	-39
Piazzi iii, 103	6.3	2.80	8.2	16 14.2	19 50.2	+ 6 19.2	-1.1967	0.5433	0.1636	-38	-74
Mayer 136	5.9	2.79	7.2	17 3.2	22 20.8	-11 22.8	-1.0410	0.5440	0.1543	-24	-73
B. A. C. 1239	6.3	2.77	6.7	17 2.2	5 53.0	- 7 57.4	-0.4877	0.5444	0.1492	+11	-59
Piazzi iii, 249	6.1	+2.76	+ 6.2	+17 5.6	9 22.4	- 4 34.9	-0.0386	0.5448	+0.1438	+36	-31
B.D. +16°, 569	6.2	2.75	6.0	17 2.4	11 30.7	- 2 30.7	+0.3230	0.5450	0.1405	+58	-11
B.D. +18°, 624	6.0	2.76	5.2	18 31.3	15 12.6	+ 1 3.9	-0.7699	0.5455	0.1347	- 5	-71
δ <sup>1</sup> Tauri	3.9	2.73	5.3	17 19.6	16 25.0	+ 2 14.0	+0.6850	0.5457	0.1327	+90	+ 9
δ <sup>2</sup> Tauri	4.9	2.73	5.2	17 13.8	16 57.9	+ 2 45.8	+0.8014	0.5457	0.1318	+90	+20
B. A. C. 1361	6.0	+2.75	+ 4.8	+18 49.8	17 20.5	+ 3 7.7	-0.8205	0.5457	+0.1312	- 9	-71
δ <sup>3</sup> Tauri	4.3	2.73	5.0	17 43.0	17 36.8	+ 3 23.4	+0.4200	0.5458	0.1308	+65	- 5
ε Tauri	3.6	2.75	4.6	18 58.6	19 3.8	+ 4 47.6	-0.7557	0.5459	0.1284	- 5	-71
B.D. +17°, 750	6.2	2.71	4.5	17 49.3	21 24.5	+ 7 3.7	+0.7917	0.5462	0.1245	+90	+16
B. A. C. 1417	6.4	2.73	4.0	19 41.5	22 23.5	+ 8 0.8	-1.1142	0.5462	0.1229	-31	-70
Mayer 177	6.1	+2.69	+ 3.5	+18 34.1	24 3 22.1	-11 10.4	+0.6962	0.5467	+0.1145	+90	+12
ι Tauri	5.2	2.67	3.2	18 41.0	5 45.2	- 8 52.1	+0.8398	0.5470	0.1103	+90	+21
B.D. +19°, 811	6.2	2.68	2.8	19 20.2	7 25.7	- 7 14.9	+0.3120	0.5471	0.1074	+58	- 9
B.D. +21°, 755	6.3	2.67	1.8	21 8.9	11 47.2	- 3 2.0	-1.2117	0.5475	0.0997	-43	-69
Mayer 198	6.3	2.64	2.1	19 40.8	12 21.8	- 2 28.5	+0.4467	0.5475	0.0987	+68	- 1
λ Tauri	5.2	+2.64	+ 1.8	+20 17.8	13 25.0	- 1 27.3	-0.1231	0.5476	+0.0968	+31	-31
107 Tauri	6.5	2.63	1.9	19 44.4	13 54.4	- 0 58.9	+0.5311	0.5476	0.0959	+75	+ 4
B. A. C. 1639	6.2	2.60	1.2	20 2.3	18 45.5	+ 3 42.6	+0.6509	0.5479	0.0870	+88	+12
B. A. C. 1651	6.5	2.59	1.1	19 43.3	19 33.3	+ 4 28.8	+1.0663	0.5480	0.0856	+90	+40
ο Tauri	4.8	2.60	0.2	21 51.5	22 37.9	+ 7 27.2	-1.0164	0.5482	0.0799	-24	-68
Piazzi v, 125	6.1	+2.55	+ 0.2	+20 24.5	25 1 27.7	+10 11.4	+0.7887	0.5482	+0.0746	+90	+21
ζ Tauri	3.0	2.58	- 0.3	21 5.2	3 18.6	+11 58.7	+0.1815	0.5483	0.0711	+49	-12
141 Tauri	6.3	2.47	2.1	22 23.9	14 28.2	- 1 13.8	-0.5839	0.5485	0.0498	+ 5	-56
B. A. C. 1970	6.0	2.43	2.5	22 12.3	18 7.4	+ 2 18.1	-0.2018	0.5484	0.0428	+27	-30
3 Geminorum	5.6	2.45	2.8	23 7.7	18 11.7	+ 2 22.3	-1.2152	0.5484	0.0426	-46	-67
6 Geminorum	6.3	+2.43	- 2.8	+22 55.8	19 24.0	+ 3 32.2	-0.9463	0.5484	+0.0403	-19	-67
η Geminorum	3.5	2.41	2.9	22 32.0	20 36.1	+ 4 41.9	-0.4639	0.5483	0.0380	+12	-46
μ Geminorum	3.2	2.38	3.4	22 33.7	28 0 21.3	+ 8 19.7	-0.3656	0.5482	0.0306	+18	-39
B. A. C. 2064	6.0	2.37	3.7	23 22.7	1 32.8	+ 9 28.9	-1.2312	0.5481	0.0283	-50	-67
δ Geminorum	5.2	2.21	4.8	21 52.2	13 41.4	- 2 46.7	+0.6318	0.5472	+0.0046	+87	+19
44 Geminorum	5.9	+2.15	- 5.7	+22 46.5	20 5.9	+ 3 25.2	-0.3791	0.5465	-0.0079	+17	-38

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>		
		$\Delta\alpha$	$\Delta\delta$										
		<i>s</i>	<i>"</i>	<i>°</i>	<i>d h m</i>	<i>h m</i>				<i>°</i>	<i>'</i>		
NEPTUNE				+21 47.4	26 22 9.4	+ 5 24.5	+0.6896	0.5466	-0.0119	+90	+22		
Lalande 13849	6.5	+2.10	-5.8	21 24.5	22 22.9	+ 5 37.7	+1.1096	0.5463	0.0123	+90	+50		
$\delta$ Geminorum	3.5	2.06	6.1	22 9.1	27 3 3.1	+10 8.6	+0.2081	0.5456	0.0213	+51	- 5		
58 Geminorum	6.0	2.05	6.7	23 7.4	4 36.2	+11 38.7	-0.9007	0.5454	0.0243	-16	-67		
B. A. C. 2455	6.4	2.00	6.3	21 43.2	6 13.6	-10 47.2	+0.6087	0.5452	0.0274	+84	+16		
63 Geminorum	5.3	+2.00	-6.4	+21 38.1	6 38.4	-10 23.2	+0.6923	0.5451	-0.0282	+90	+20		
B.D.+23°, 1744	6.4	1.99	7.0	23 5.1	9 0.7	- 8 5.5	-0.9841	0.5447	0.0328	-22	-67		
B. A. C. 2544	6.3	1.94	7.3	22 37.0	13 59.0	- 3 17.0	-0.6536	0.5439	0.0422	+ 1	-62		
$\mu$ Cancri	5.5	1.78	8.0	21 51.0	28 1 33.3	+ 7 54.9	-0.4177	0.5418	0.0636	+15	-46		
Piazzi viii, 42	6.0	1.69	8.1	21 2.4	7 34.2	-10 16.0	+0.0634	0.5406	0.0745	+42	-19		
$\eta$ Cancri	5.4	+1.61	-8.4	+20 45.3	13 30.0	- 4 31.6	-0.0958	0.5394	-0.0850	+33	-28		
39 Cancri	6.5	1.56	8.4	20 20.1	17 3.8	- 1 4.6	+0.0556	0.5386	0.0911	+42	-21		
40 Cancri	6.5	1.55	8.4	20 17.9	17 6.3	- 1 2.2	+0.0919	0.5386	0.0912	+44	-19		
B. A. C. 2919	6.5	1.55	8.4	19 59.8	17 11.6	- 0 57.1	+0.4162	0.5386	0.0914	+65	- 2		
$\epsilon$ Cancri	6.3	1.55	8.3	19 52.3	17 14.2	- 0 54.5	+0.5504	0.5386	0.0914	+77	+ 6		
B. A. C. 2991	6.1	+1.48	-8.3	+19 10.6	22 12.9	+ 3 54.6	+0.8401	0.5375	-0.0999	+90	+22		
8 Leonis	5.9	1.19	8.3	16 51.2	29 20 49.8	+ 1 48.8	+0.7247	0.5329	0.1355	+90	+11		
B.D.+16°, 2077	6.3	1.02	8.3	16 12.5	30 11 0.4	- 8 27.0	-0.6343	0.5305	0.1554	+ 3	-70		
37 Leonis	5.5	0.96	7.7	14 11.4	16 29.8	- 3 7.7	+0.6962	0.5298	0.1625	+90	+ 6		
42 Leonis	6.1	0.93	8.1	15 26.5	19 3.6	- 0 38.7	-1.0892	0.5294	0.1657	-26	-75		
<i>i</i> Leonis	5.8	+0.88	-7.8	+14 36.8	31 0 14.7	+ 4 22.9	-1.0593	0.5289	-0.1719	-24	-75		
<i>l</i> Leonis	5.3	+0.79	-6.7	+11 2.1	8 49.1	-11 18.5	+1.3063	0.5282	-0.1816	+90	+54		

## NOVEMBER.

$\omega$ Virginis	5.4	+0.57	-5.7	+ 8 38.8	1 9 33.6	-11 19.2	-0.9143	0.5283	-0.2043	-13	-81
$\nu$ Virginis	4.2	0.53	5.3	7 2.9	13 16.6	- 7 43.0	+0.0309	0.5286	0.2070	+40	-35
B.D.+6°, 2343	6.5	0.47	4.7	6 4.6	22 14.5	+ 0 58.5	-0.8126	0.5298	0.2126	- 6	-84
$\epsilon$ Virginis	5.1	0.42	4.0	3 49.8	2 6 31.6	+ 9 0.4	-0.2070	0.5314	0.2168	+27	-50
Piazzi xii, 142	5.9	0.38	-3.3	+ 2 21.9	15 26.4	- 6 21.4	-0.6080	0.5336	0.2201	+ 6	-79
NEW MOON.											
Mayer 679	5.9	+0.49	+2.1	-20 15.6	7 9 3.0	+ 7 19.6	+0.6410	0.5931	-0.1189	+65	- 2
B. A. C. 5700	6.1	0.50	2.4	19 23.5	10 30.9	+ 8 44.0	-0.4029	0.5938	0.1157	+ 4	-64
29 Ophiuchi	6.4	0.51	2.6	18 44.9	12 25.7	+10 34.3	-1.2674	0.5947	0.1115	-60	-90
B. A. C. 5746	6.2	0.53	2.3	20 21.8	13 33.1	+11 39.0	+0.2320	0.5952	0.1090	+38	-25
Bradley 2162	6.3	+0.54	+2.1	-21 26.1	14 6.3	-11 49.1	+1.2492	0.5955	-0.1078	+69	+49
$\xi$ Ophiuchi	4.4	0.59	2.3	21 0.8	19 56.1	- 6 13.0	+0.2345	0.5978	0.0943	+36	-25
B. A. C. 5866	5.9	0.59	2.5	21 21.3	21 23.4	- 4 49.2	+0.4432	0.5984	0.0909	+49	-13
52 Ophiuchi	6.4	0.63	2.6	21 58.8	8 1 31.4	- 0 51.2	+0.7162	0.5998	0.0809	+68	+ 3
58 Ophiuchi	4.8	0.65	2.8	21 38.3	4 41.6	+ 2 11.4	+0.1275	0.6007	0.0732	+27	-31
B. A. C. 6088	5.7	+0.73	+2.9	-22 46.7	11 49.6	+ 9 2.1	+0.8128	0.6024	-0.0553	+67	+ 9
B. A. C. 6125	6.2	0.74	3.3	21 27.2	13 53.2	+11 0.8	-0.6251	0.6028	0.0500	-15	-86
$\mu$ Sagittarii	4.1	0.77	3.5	21 5.0	16 25.6	-10 33.0	-1.1154	0.6032	0.0435	-49	-90
14 Sagittarii	5.6	0.77	3.4	21 44.2	16 36.6	-10 22.5	-0.4663	0.6032	0.0430	- 6	-70
Bradley 2332	5.7	0.86	3.9	21 28.5	9 1 42.4	- 1 38.8	-1.0147	0.6038	0.0193	-42	-90
Bradley 2335	5.8	+0.88	+3.3	-23 35.0	1 54.3	- 1 27.4	+1.0993	0.6038	-0.0188	+66	+32
28 Sagittarii	5.6	0.91	3.7	22 29.3	4 55.9	- 1 26.8	-0.0448	0.6038	0.0109	+13	-41
URANUS				23 26.6	5 47.2	- 1 40.6	+0.9054	0.6022	0.0088	+67	+14
30 Sagittarii	6.2	0.92	4.0	22 16.1	6 40.0	+ 3 6.7	-0.2817	0.6036	0.0063	0	-56
33 Sagittarii	5.8	0.93	4.3	21 28.4	7 53.6	+ 4 17.3	-1.0859	0.6035	0.0031	-49	-90
$\nu$ Sagittarii	5.0	+0.94	+3.9	-22 51.5	7 56.2	+ 4 19.8	+0.3059	0.6035	-0.0030	+33	-21
$\nu$ Sagittarii	5.1	0.95	3.9	22 47.2	8 17.9	+ 4 40.5	+0.2327	0.6035	0.0020	+28	-25
Piazzi xviii, 225	5.9	0.95	3.8	23 17.5	8 38.2	+ 5 0.1	+0.7392	0.6034	-0.0011	+67	+ 4
B. A. C. 6485	6.3	0.98	4.0	22 49.5	10 48.4	+ 7 5.1	+0.2750	0.6032	+0.0046	+31	-23
$\sigma$ Sagittarii	3.9	0.99	4.3	21 52.6	11 59.6	+ 8 13.4	-0.6708	0.6031	0.0077	-21	-90
Lalande 35745	6.5	+1.01	+4.0	-23 20.2	13 32.3	+ 9 42.3	+0.8103	0.6028	+0.0117	+67	+ 9

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.											
NOVEMBER.											
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle. H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
B. A. C. 6561	6.4	+1.02	+ 4.5	-21 48.7	9 14 59.8	+10 6.3	-0.7017	0.6026	+0.0155	-22	-90
Piazzi xix, 61	5.5	1.06	4.5	22 34.5	18 8.4	- 9 52.8	+0.1266	0.6020	0.0237	+24	-31
50 Sagittarii	5.5	1.08	4.8	21 57.6	20 20.7	- 7 45.9	-0.4332	0.6015	0.0294	- 6	-67
B. A. C. 6671	6.1	1.10	5.0	21 30.3	22 7.6	- 6 3.3	-0.8348	0.6011	0.0340	-29	-90
B. A. C. 6864	6.1	1.25	5.2	22 59.5	10 10 0.0	+ 5 20.5	+1.2446	0.5970	0.0638	+67	+51
B. A. C. 6878	6.5	+1.26	+ 5.3	-22 51.3	10 55.4	+ 6 13.7	+1.1670	0.5967	+0.0660	+67	+39
4 Capricorni	5.7	1.33	5.8	22 5.8	16 34.3	+11 39.2	+0.8135	0.5942	0.0795	+68	+ 9
20 Capricorni	6.2	1.51	7.6	19 23.6	11 9 19.7	+ 3 45.7	-0.2658	0.5854	0.1168	+11	-55
7 Capricorni	4.8	1.54	7.4	20 13.3	11 17.1	+ 5 38.7	+0.8050	0.5843	0.1208	+70	+ 8
B.D.-17°, 6216	6.1	1.58	8.5	17 43.7	15 43.2	+ 9 54.7	-1.1683	0.5816	0.1297	-45	-90
30 Capricorni	5.4	+1.60	+ 8.3	-18 22.4	16 53.4	+11 2.2	-0.3606	0.5809	+0.1319	+ 8	-61
31 Capricorni	6.3	1.60	8.5	17 51.0	17 1.3	+11 9.8	-0.8736	0.5808	0.1322	-22	-90
1 Capricorni	4.3	1.62	8.8	17 13.7	18 41.1	-11 14.1	-1.2829	0.5798	0.1354	-60	-90
MARS				16 55.7	23 2.6	- 7 2.3	-0.9847	0.5525	0.1338	-28	-90
7 Capricorni	3.7	1.71	9.1	17 4.8	12 2 9.8	- 4 2.1	-0.3712	0.5753	0.1490	+ 9	-61
8 Capricorni	2.9	+1.74	+ 9.2	-16 32.8	5 6.8	- 1 11.6	-0.4671	0.5734	+0.1540	+ 5	-69
B.D.-17°, 6389	6.5	1.75	9.2	17 16.6	6 28.2	+ 0 6.9	+0.4866	0.5726	0.1563	+59	-12
39 Aquarii	6.2	1.85	10.4	14 38.9	16 4.3	+ 9 22.2	-0.6197	0.5667	0.1712	- 2	-82
45 Aquarii	6.1	1.88	10.9	13 46.1	18 57.2	-11 51.0	-1.0218	0.5650	0.1713	-27	-90
50 Aquarii	5.9	1.90	10.9	13 59.9	21 20.6	- 9 32.7	-0.3639	0.5635	0.1786	+13	-61
Bradley 2961	6.2	+1.94	+11.1	-13 23.3	23 48.3	- 7 10.2	-0.5443	0.5620	+0.1818	+ 4	-75
56 Aquarii	6.1	1.93	10.5	15 3.5	23 55.0	- 7 3.7	+1.1856	0.5620	0.1820	+75	+36
74 Aquarii	5.8	2.03	11.8	12 6.5	18 10 19.1	+ 2 58.8	+0.1205	0.5562	0.1942	+41	-32
B.D.-11°, 6032	6.3	2.13	12.2	11 11.4	20 0.0	-11 40.0	+1.1061	0.5512	0.2036	+79	+27
74 Aquarii	4.5	2.15	12.7	9 35.5	20 33.1	-11 8.0	-0.4300	0.5510	0.2040	+12	-65
74 Aquarii	4.6	+2.14	+12.7	- 9 41.2	21 29.8	-10 13.1	-0.1381	0.5505	+0.2048	+28	-46
74 Aquarii	5.2	2.14	12.5	10 7.0	21 59.0	- 9 45.0	+0.4040	0.5503	0.2053	+60	-18
B.D.-10°, 6120	6.3	2.19	12.7	9 46.5	14 2 39.2	- 5 14.0	+1.0200	0.5482	0.2089	+80	+20
B. A. C. 8214	6.5	2.22	13.2	7 58.5	5 42.2	- 2 17.1	-0.1973	0.5468	0.2110	+26	-50
Mayer 1012	6.3	2.27	13.5	6 53.6	11 49.4	+ 3 38.1	-0.0135	0.5444	0.2148	+36	-39
30 Piscium	4.7	+2.33	+13.5	- 6 31.6	18 11.5	+ 9 47.9	+0.9864	0.5421	+0.2179	+83	+17
33 Piscium	4.7	2.34	13.7	6 13.4	19 48.4	+11 21.7	+1.0245	0.5416	0.2186	+84	+20
Piazzi o, 1	6.0	2.37	13.7	5 45.7	22 11.1	-10 20.3	+1.0659	0.5408	0.2195	+84	+23
B. A. C. 81	6.3	2.43	14.3	2 43.8	15 5 0.3	- 3 44.2	-0.5836	0.5389	0.2215	+ 7	-77
14 Ceti	5.4	2.49	14.6	1 0.7	10 20.3	+ 1 25.7	-1.1909	0.5377	0.2224	-33	-90
20 Ceti	4.9	+2.55	+14.1	- 1 38.7	18 50.6	+ 9 39.9	+1.3648	0.5361	+0.2228	+88	+58
26 Ceti	6.0	2.61	14.4	+ 0 52.4	16 0 6.7	- 9 13.9	-0.0979	0.5353	0.2225	+33	-44
33 Ceti	6.1	2.63	14.5	1 57.3	3 24.8	- 6 1.9	-0.4995	0.5350	0.2220	+12	-70
f Piscium	5.1	2.66	14.5	3 7.7	6 57.6	- 2 35.8	-0.9472	0.5347	0.2212	-14	-87
Lalande 2632	6.5	2.70	14.2	3 3.4	11 25.4	+ 1 43.7	+0.1123	0.5345	0.2200	+45	-32
v Piscium	4.6	+2.76	+14.1	+ 5 1.3	18 33.5	+ 8 38.5	-0.3973	0.5343	+0.2173	+17	-62
Piazzi i, 249	6.5	2.86	13.5	7 17.6	17 6 2.9	- 4 13.7	-0.3381	0.5348	0.2111	+20	-57
64 Ceti	5.8	2.87	13.2	8 8.3	9 14.4	- 1 8.2	-0.5634	0.5350	0.2090	+ 8	-72
51 Ceti	4.5	2.89	13.3	8 24.9	10 2.4	- 0 21.7	-0.6892	0.5351	0.2085	+ 1	-82
25 Arietis	6.5	2.93	12.6	9 47.4	17 5.6	+ 6 28.3	-0.6999	0.5358	0.2031	+ 1	-80
52 Ceti	4.5	+2.93	+12.5	+ 8 2.8	17 28.2	+ 6 50.2	+1.2302	0.5358	+0.2028	+90	+40
B. F. 310	6.3	2.94	12.6	9 9.3	18 9.6	+ 7 30.3	+0.1921	0.5359	0.2023	+49	-26
85 Ceti	6.3	2.99	12.0	10 20.9	18 0 26.8	-10 24.2	+0.1741	0.5368	0.1967	+48	-26
μ Ceti	4.3	3.00	11.8	9 43.5	1 38.3	- 9 15.0	+1.0735	0.5370	0.1956	+90	+27
W. B. ii, 1033	5.8	3.08	10.8	12 49.9	12 2.4	+ 0 49.5	-0.2662	0.5387	0.1849	+24	-49
Mayer 121	6.4	+3.16	+ 8.9	+15 7.7	10 3 8.2	- 8 33.6	-0.0765	0.5416	+0.1664	+34	-36
Piazzi iii, 103	6.3	3.19	8.8	16 14.2	3 54.0	- 7 49.3	-1.1441	0.5418	0.1654	-32	-74
Mayer 136	5.9	3.20	7.8	17 3.2	10 26.7	- 1 29.2	-0.9728	0.5431	0.1563	-18	-73
B. A. C. 1239	6.3	3.22	7.2	17 2.2	13 59.9	+ 1 57.1	-0.4098	0.5439	0.1511	+16	-54
Piazzi iii, 249	6.1	3.23	6.8	17 5.6	17 29.9	+ 5 20.4	+0.0481	0.5446	0.1459	+41	-27
B. D. +16°, 569	6.2	+3.22	+ 6.4	+17 2.4	19 38.6	+ 7 24.9	+0.4152	0.5450	+0.1426	+65	- 7

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S				AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.	
		$\Delta\alpha$	$\Delta\delta$									
		s	"	°	d h m	h m				°	'	
B.D.+18°,624	6.0	+3.26	+ 5.8	+18 31.3	19 23 20.8	+10 59.8	-0.6727	0.5457	+0.1368	+ 1	-70	
$\delta^s$ Tauri	3.9	3.24	5.6	17 19.6	20 0 33.4	-11 49.9	+0.7880	0.5460	0.1349	+90	+15	
$\delta^s$ Tauri	4.9	3.24	5.6	17 13.8	1 6.3	-11 18.1	+0.9660	0.5461	0.1340	+90	+27	
B. A. C. 1361	6.0	3.28	5.4	18 49.8	1 28.9	-10 56.3	-0.7190	0.5461	0.1334	- 2	-71	
$\delta^s$ Tauri	4.3	3.25	5.4	17 43.0	1 45.2	-10 40.5	+0.5248	0.5462	0.1330	+74	0	
$\epsilon$ Tauri	3.6	+3.28	+ 5.1	+18 58.6	3 12.3	- 9 16.2	-0.6505	0.5464	+0.1305	+ 2	-68	
B.D.+17°,750	6.2	3.24	4.8	17 49.3	5 33.1	- 7 0.0	+0.9047	0.5469	0.1267	+90	+23	
B. A. C. 1417	6.4	3.28	4.6	19 41.5	6 32.1	- 6 2.9	-1.0030	0.5470	0.1251	-21	-70	
Mayer 177	6.1	3.26	3.9	18 34.1	11 30.5	- 1 14.3	+0.8202	0.5478	0.1166	+90	+19	
$i$ Tauri	5.2	3.26	3.5	18 41.0	13 53.4	+ 1 3.9	+0.9685	0.5482	0.1125	+90	+29	
B.D.+19°,811	6.2	+3.27	+ 3.1	+19 20.2	15 33.7	+ 2 40.9	+0.4430	0.5485	+0.1096	+67	- 2	
B.D.+21°,755	6.3	3.30	2.2	21 8.9	19 54.6	+ 6 53.2	-1.0746	0.5491	0.1018	-28	-69	
Mayer 198	6.3	3.26	2.3	19 40.8	20 29.1	+ 7 26.6	+0.5867	0.5492	0.1008	+80	+ 7	
$i$ Tauri	5.2	3.26	2.0	20 17.8	21 32.1	+ 8 27.4	+0.0181	0.5494	0.0989	+40	-23	
107 Tauri	6.5	3.26	2.1	19 44.4	22 1.4	+ 8 55.8	+0.6740	0.5494	0.0980	+90	+12	
B. A. C. 1639	6.2	+3.25	+ 1.2	+20 2.3	21 2 51.6	-10 23.5	+0.8021	0.5500	+0.0891	+90	+21	
B. A. C. 1651	6.5	3.24	1.1	19 43.3	3 39.2	- 9 37.5	+1.2191	0.5500	0.0876	+90	+54	
$\alpha$ Tauri	4.8	3.28	0.3	21 51.5	6 43.1	- 6 39.7	-0.8599	0.5503	0.0819	-12	-68	
Piazz1 v, 125	6.1	3.24	+0.1	20 24.5	9 32.1	- 3 56.3	+0.9509	0.5505	0.0766	+90	+32	
$\zeta$ Tauri	3.0	3.24	-0.4	21 5.2	11 22.4	- 2 9.6	+0.3464	0.5506	0.0731	+60	- 3	
Piazz1 v, 184	6.5	+3.27	-0.9	+22 36.9	13 23.5	- 0 12.6	-1.1861	0.5508	+0.0692	-41	-67	
141 Tauri	6.3	3.22	2.4	22 23.9	22 28.7	+ 8 34.5	-0.4021	0.5510	0.0516	+16	-43	
B. A. C. 1970	6.0	3.20	3.0	22 12.3	22 2 6.6	-11 55.0	-0.0147	0.5510	0.0444	+38	-20	
3 Geminorum	5.6	3.21	3.2	23 7.7	2 10.9	-11 50.7	-1.0282	0.5510	0.0442	-25	-67	
6 Geminorum	6.3	3.20	3.3	22 55.7	3 22.8	-10 41.2	-0.7575	0.5510	0.0419	- 6	-67	
$\eta$ Geminorum	3.5	+3.18	- 3.4	+22 32.0	4 34.5	- 9 31.9	-0.2733	0.5509	+0.0397	+23	-34	
$\mu$ Geminorum	3.2	3.16	4.2	22 33.6	8 18.3	- 5 55.6	-0.1700	0.5508	0.0321	+29	-27	
B. A. C. 2064	6.0	3.17	4.4	23 22.7	9 29.4	- 4 46.8	-1.0340	0.5507	0.0298	-26	-67	
$\delta$ Geminorum	5.2	3.04	6.0	21 52.2	21 33.9	+ 6 53.5	+0.8447	0.5497	0.0058	+90	+32	
B. A. C. 2238	5.8	3.08	6.5	23 42.6	21 44.4	+ 7 3.7	-1.1878	0.5497	+0.0054	-43	-66	
44 Geminorum	5.9	+3.01	- 7.2	+22 46.5	23 3 56.4	-10 56.7	-0.1595	0.5489	-0.0069	+29	-24	
NEPTUNE	...	...	...	21 49.1	5 20.0	- 9 35.8	+0.8867	0.5495	0.0097	+90	+34	
$\delta$ Geminorum	3.5	2.93	8.0	22 9.1	10 51.7	- 4 15.0	+0.4356	0.5476	0.0203	+67	+ 7	
58 Geminorum	6.0	2.93	8.5	23 7.3	12 24.5	- 2 45.3	-0.6727	0.5474	0.0235	0	-62	
B. A. C. 2455	6.4	2.87	8.2	21 43.2	14 1.5	- 1 11.5	+0.8397	0.5470	0.0266	+90	+29	
63 Geminorum	5.3	+2.88	- 8.4	+21 38.0	14 26.2	- 0 47.6	+0.9238	0.5469	-0.0274	+90	+35	
B.D.+23°,1744	6.4	2.88	9.0	23 5.0	16 48.0	+ 1 29.6	-0.7523	0.5464	0.0320	- 5	-67	
B.D.+23°,1780	6.3	2.85	9.6	23 13.9	20 37.0	+ 5 11.0	-1.0526	0.5456	0.0393	-28	-67	
B. A. C. 2544	6.3	2.82	9.6	22 37.0	21 45.4	+ 6 17.2	-0.4171	0.5453	0.0415	+15	-43	
$\mu^s$ Cancri	5.5	2.68	10.8	21 50.9	24 9 18.6	- 6 32.2	-0.1720	0.5424	0.0631	+28	-30	
Piazz1 viii, 42	6.0	+2.60	-11.2	+21 2.3	15 19.4	- 0 43.1	+0.3141	0.5408	-0.0740	+58	- 6	
$\eta$ Cancri	5.4	2.52	11.7	20 45.3	21 15.7	+ 5 1.8	+0.1581	0.5391	0.0845	+48	-15	
39 Cancri	6.5	2.47	11.9	20 20.0	25 0 50.0	+ 8 29.3	+0.3117	0.5380	0.0907	+58	- 7	
40 Cancri	6.5	2.47	11.9	20 17.8	0 52.5	+ 8 31.7	+0.3481	0.5380	0.0907	+60	- 5	
B. A. C. 2919	6.5	2.46	11.8	19 59.8	0 57.8	+ 8 36.9	+0.6736	0.5380	0.0909	+90	+13	
$\epsilon$ Cancri	6.3	+2.46	-11.8	+19 52.3	1 0.4	+ 8 39.4	+0.8082	0.5380	-0.0910	+90	+21	
B. A. C. 2991	6.1	2.39	12.0	19 10.6	6 0.2	-10 30.3	+1.1016	0.5365	0.0994	+90	+41	
8 Leonis	5.9	2.09	12.8	16 51.1	26 4 46.5	+11 33.3	+0.9924	0.5299	0.1349	+90	+28	
B.D.+16°, 2077	6.3	1.90	13.2	16 12.4	19 7.1	+ 1 27.4	-0.3757	0.5263	0.1545	+18	-52	
37 Leonis	5.5	1.82	12.7	14 11.3	27 0 41.0	+ 6 51.2	+0.9622	0.5251	0.1615	+90	+22	
42 Leonis	6.1	+1.80	-13.2	+15 26.5	3 17.2	+ 9 22.6	-0.8364	0.5246	-0.1646	- 9	-75	
$i$ Leonis	5.8	1.73	13.0	14 36.7	8 33.1	- 9 31.0	-0.8088	0.5236	0.1708	- 7	-75	
$\omega$ Virginis	5.4	1.33	11.1	8 38.8	28 18 29.7	-0 35.2	-0.6896	0.5216	0.2027	+ 1	-81	
$\nu$ Virginis	4.2	1.29	10.7	7 2.9	22 17.4	+ 3 5.8	+0.2585	0.5218	0.2054	+53	-23	
B.D.+6°,2543	6.5	1.19	10.0	6 4.5	29 7 26.4	+11 58.3	-0.6029	0.5228	0.2111	+ 6	-77	
$\epsilon$ Virginis	5.1	+1.11	- 9.1	+ 3 49.7	15 53.8	- 3 49.5	-0.0046	0.5244	-0.2154	+38	-38	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.											
NOVEMBER.											
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
Piazzi xii, 142	5.9	+1.04	- 8.3	+ 2 21.9	30 0 59.2	+ 4 59.5	-0.4226	0.5268	-0.2189	+16	-64
DECEMBER.											
80 Virginis	5.6	+0.85	- 5.0	- 4 55.4	1 5 7.4	+ 8 15.1	+1.0066	0.5385	-0.2211	+85	+18
Piazzi xiii, 174	6.4	+0.82	- 4.8	- 5 1.9	9 8.8	-11 51.2	+0.2291	0.5408	-0.2203	+51	-26
" Virginis	6.5	0.81	4.4	6 22.5	11 13.9	- 9 50.1	+1.1626	0.5420	0.2197	+84	+31
Lalande 26147	6.5	0.74	- 3.7	7 6.4	2 1 8.0	+ 3 36.7	-1.0986	0.5507	-0.2137	-27	-90
NEW MOON.											
B. A. C. 6485	6.3	+0.81	+ 4.0	-22 49.5	6 18 59.8	- 6 55.8	+0.1429	0.6145	+0.0032	+23	-30
" Sagittarii	3.9	0.82	4.2	21 52.6	20 8.6	- 5 49.9	-0.7897	0.6144	0.0064	-28	-90
Lalande 35745	6.5	0.83	4.0	23 20.2	21 38.0	- 4 24.2	+0.6660	0.6141	0.0105	+60	0
B. A. C. 6561	6.4	0.83	4.3	21 48.7	23 2.4	- 3 3.4	-0.8241	0.6139	0.0144	-30	-90
Piazzi xix, 61	5.5	0.86	4.4	22 34.5	7 2 4.4	- 0 9.1	-0.0130	0.6134	0.0228	+16	-39
50 Sagittarii	5.5	+0.88	+ 4.6	-21 57.6	4 12.1	+ 1 53.3	-0.5668	0.6129	+0.0286	-13	-79
B. A. C. 6671	6.1	0.89	4.7	21 30.3	5 55.3	+ 3 32.2	-0.9647	0.6128	0.0334	-37	-90
53 Sagittarii	6.3	0.92	4.4	23 38.3	9 14.1	+ 6 42.6	+1.2744	0.6114	0.0423	+66	+64
B. A. C. 6864	6.1	1.00	4.9	22 59.5	17 22.8	- 9 28.9	+1.0685	0.6081	0.0639	+67	+28
B. A. C. 6878	6.5	1.00	5.0	22 51.3	18 16.3	- 8 37.6	+0.9912	0.6077	0.0662	+67	+22
4 Capricorni	5.7	+1.04	+ 5.3	-22 5.8	23 43.5	- 3 23.9	+0.6374	0.6050	+0.0801	+61	- 2
20 Capricorni	6.2	1.19	6.6	19 23.7	8 15 56.3	-11 50.2	-0.4411	0.5948	0.1181	+ 2	-67
7 Capricorni	4.8	1.21	6.4	20 13.3	17 50.1	-10 0.9	+0.6133	0.5935	0.1221	+65	- 4
30 Capricorni	5.4	1.26	7.1	18 22.4	23 16.5	- 4 47.3	-0.5405	0.5896	0.1334	- 2	-75
31 Capricorni	6.3	1.26	7.2	17 51.0	23 24.2	- 4 39.9	-1.0467	0.5895	0.1337	-34	-90
7 Capricorni	3.7	+1.36	+ 7.7	-17 4.8	9 8 17.7	+ 3 53.3	-0.5570	0.5828	+0.1506	- 1	-76
" Capricorni	2.9	1.40	7.6	16 32.8	11 10.1	+ 6 39.2	-0.6535	0.5806	0.1557	- 6	-87
B.D.-17°, 6389	6.5	1.40	7.7	17 16.6	12 29.6	+ 7 55.8	+0.2884	0.5796	0.1580	+46	-23
29 Aquarii	6.5	1.46	7.8	17 24.6	17 37.0	-11 8.3	+1.2563	0.5757	0.1664	+73	+46
39 Aquarii	6.2	1.50	8.7	14 39.0	21 52.6	- 7 2.0	-0.8098	0.5724	0.1729	-13	-90
45 Aquarii	6.1	+1.53	+ 9.1	-13 46.1	10 0 41.9	- 4 18.9	-1.2090	0.5703	+0.1770	-43	-90
50 Aquarii	5.9	1.56	9.1	13 59.9	3 2.5	- 2 3.4	-0.5583	0.5685	0.1802	+ 3	-76
Bradley 2961	6.2	1.59	9.2	13 23.3	5 27.5	+ 0 16.4	-0.7378	0.5607	0.1834	- 7	-90
56 Aquarii	6.1	1.59	8.7	15 3.5	5 34.1	+ 0 22.8	+0.9768	0.5666	0.1835	+75	+18
74 Aquarii	5.8	1.70	9.8	12 6.5	15 48.4	+10 15.5	-0.0795	0.5593	0.1955	+30	-43
B.D.-11°, 6032	6.3	+1.80	+10.0	-11 11.5	11 1 22.8	- 4 29.9	+0.9018	0.5530	+0.2046	+79	+12
" Aquarii	4.5	1.83	10.6	9 35.5	1 55.5	- 3 58.3	-0.6256	0.5527	0.2051	+ 2	-81
" Aquarii	4.6	1.82	10.6	9 41.2	2 51.7	- 3 3.9	-0.3352	0.5521	0.2058	+18	-58
" Aquarii	5.2	1.85	10.4	10 7.0	3 20.6	- 2 36.0	+0.2042	0.5518	0.2062	+47	-27
B.D.-10°, 6120	6.3	1.88	10.5	9 46.5	7 58.8	+ 1 52.9	+0.8190	0.5490	0.2097	+80	+ 6
B. A. C. 8214	6.5	+1.91	+11.1	- 7 58.6	11 0.6	+ 4 48.6	-0.3919	0.5473	+0.2118	+16	-62
Mayer 1012	6.3	1.98	11.3	6 53.6	17 6.4	+10 42.4	-0.2062	0.5440	0.2153	+26	-50
30 Piscium	4.7	2.05	11.3	6 31.7	23 28.0	- 7 8.3	+0.7952	0.5410	0.2183	+83	+ 5
33 Piscium	4.7	2.07	11.5	6 13.5	12 1 4.8	- 5 34.6	+0.8344	0.5403	0.2188	+84	+ 7
Piazzi o 1	6.0	2.10	11.5	5 45.7	3 27.7	- 3 16.3	+0.8777	0.5392	0.2197	+84	+10
B. A. C. 81	6.3	+2.18	+12.3	- 2 43.8	10 17.9	+ 3 20.8	-0.7650	0.5366	+0.2214	- 4	-90
14 Ceti	5.4	2.26	12.7	1 0.8	15 39.5	+ 8 32.3	-1.3686	0.5348	0.2222	-60	-90
20 Ceti	4.9	2.34	12.1	- 1 38.7	18 0 13.4	- 7 10.0	+1.1977	0.5324	0.2224	+88	+33
26 Ceti	6.0	2.42	12.6	+ 0 52.3	5 32.4	- 2 0.9	-0.2617	0.5313	0.2219	+24	-54
33 Ceti	6.1	2.45	12.8	1 57.3	8 52.6	+ 1 13.2	-0.6607	0.5308	0.2214	+ 3	-84
" Piscium	5.1	+2.50	+12.9	+ 3 7.7	12 27.8	+ 4 41.7	-1.1059	0.5302	+0.2206	-26	-87
Lalande 2632	6.5	2.54	12.6	3 3.4	16 58.7	+ 9 4.3	-0.0379	0.5297	0.2193	+37	-40
" Piscium	4.6	2.64	12.7	5 1.2	14 0 12.5	- 7 55.2	-0.5403	0.5292	0.2165	+10	-72
Piazzi i, 249	6.5	2.78	12.3	7 17.6	11 52.1	+ 3 22.9	-0.4654	0.5293	0.2104	+14	-66
64 Ceti	5.8	2.81	12.2	8 8.3	15 6.6	+ 6 31.5	-0.6874	0.5295	0.2083	+ 1	-81
" Ceti	4.5	+2.83	+12.3	+ 8 24.8	15 55.4	+ 7 18.8	-0.8127	0.5295	+0.2077	- 6	-82



ELEMENTS FOR THE PREDICTION OF OCULTATIONS.

DECEMBER.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'n's from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ		d h m	h m					
25 Arietis	6.5	+2.90	+11.7	+ 9 47.3	14 23 5.3	- 9 44.5	-0.8134	0.5302	+0.2025	- 6	-80
ξ Ceti	4.5	2.90	11.4	8 2.8	23 28.3	- 9 22.2	+1.1276	0.5302	0.2022	+90	+30
B. F. 310	6.3	2.92	11.6	9 9.2	15 0 10.4	- 8 41.5	+0.0850	0.5303	0.2016	+43	-32
85 Ceti	6.3	2.99	11.2	10 20.9	6 33.7	- 2 29.9	+0.0764	0.5312	0.1961	+43	-31
μ Ceti	4.3	3.02	10.9	9 43.5	7 46.3	- 1 19.6	+0.9825	0.5314	0.1951	+90	+20
W. B. ii, 1033	5.8	+3.14	+10.3	+12 49.9	18 20.5	+ 8 55.0	-0.3486	0.5334	+0.1845	+20	-54
Mayer 121	6.4	3.31	8.6	15 7.7	16 9 40.2	- 0 14.0	-0.1342	0.5370	0.1665	+31	-39
Piazzi iii, 103	6.3	3.34	8.7	16 14.2	10 26.7	+ 0 31.0	-1.2065	0.5371	0.1655	-38	-74
Mayer 136	5.9	3.41	7.8	17 3.2	17 4.9	+ 6 56.6	-1.0241	0.5389	0.1566	-22	-73
B. A. C. 1239	6.3	3.42	7.2	17 2.2	20 40.8	+10 25.6	-0.4526	0.5398	0.1515	+14	-57
Piazzi iii, 249	6.1	+3.45	+ 6.7	+17 5.6	17 0 13.5	-10 8.5	+0.0131	0.5408	+0.1464	+39	-29
B.D.+16°, 569	6.2	3.46	6.4	17 2.4	2 23.7	- 8 2.4	+0.3852	0.5413	0.1431	+63	- 9
B.D.+18°, 624	6.0	3.52	5.9	18 31.3	6 8.6	- 4 24.8	-0.7025	0.5423	0.1374	- 1	-71
δ Tauri	3.9	3.50	5.5	17 19.6	7 21.9	- 3 13.8	+0.7671	0.5426	0.1355	+90	+14
δ Tauri	4.9	3.49	5.4	17 13.8	7 55.3	- 2 41.5	+0.9467	0.5428	0.1346	+90	+25
B. A. C. 1361	6.0	+3.54	+ 5.5	+18 49.8	8 18.1	- 2 19.4	-0.7457	0.5429	+0.1340	- 4	-69
δ Tauri	4.3	3.52	5.4	17 43.0	8 34.6	- 2 3.5	+0.5043	0.5429	0.1336	+72	0
ε Tauri	3.6	3.53	5.3	18 58.6	10 2.6	- 0 38.3	-0.6743	0.5433	0.1313	+ 1	-69
B.D.+17°, 756	6.2	3.54	4.8	17 49.3	12 24.8	+ 1 39.3	+0.8916	0.5439	0.1275	+90	+22
B. A. C. 1417	6.4	3.58	4.8	19 41.5	13 24.5	+ 2 37.1	-1.0234	0.5442	0.1259	-23	-70
Mayer 177	6.1	+3.58	+ 3.8	+18 34.1	18 25.7	+ 7 28.5	+0.8151	0.5454	+0.1175	+90	+18
i Tauri	5.2	3.60	3.4	18 41.0	20 49.8	+ 9 47.9	+0.9674	0.5461	0.1134	+90	+29
B.D.+19°, 811	6.2	3.62	3.1	19 20.2	22 31.0	+11 25.8	+0.4420	0.5463	0.1105	+67	- 3
B.D.+21°, 755	6.3	3.68	2.4	21 8.9	18 2 54.0	- 8 19.8	-1.0755	0.5472	0.1029	-28	-69
Mayer 198	6.3	3.64	2.2	19 40.8	3 28.7	- 7 46.2	+0.5931	0.5473	0.1018	+81	+ 6
i Tauri	5.2	+3.66	+ 2.1	+20 17.8	4 32.1	- 6 45.0	+0.0238	0.5475	+0.1000	+40	-23
107 Tauri	6.5	3.65	2.0	19 44.4	5 1.7	- 6 16.3	+0.6827	0.5476	0.0990	+90	+13
B. A. C. 1639	6.2	3.67	1.1	20 2.3	9 53.7	- 1 33.9	+0.8178	0.5485	0.0903	+90	+22
B. A. C. 1651	6.5	3.66	1.0	19 43.3	10 41.6	- 0 47.5	+1.2374	0.5487	0.0888	+90	+57
o Tauri	4.8	3.73	+ 0.2	21 51.5	13 46.6	+ 2 11.4	-0.8445	0.5492	0.0831	-11	-68
Piazzi v, 125	6.1	+3.69	- 0.2	+20 24.5	16 36.3	+ 4 55.4	+0.9759	0.5496	+0.0777	+90	+33
ζ Tauri	3.0	3.71	0.5	21 5.2	18 27.2	+ 6 42.7	+0.3718	0.5499	0.0743	+62	- 2
Piazzi v, 184	6.5	3.76	0.8	22 36.9	20 28.8	+ 8 40.3	-1.1627	0.5501	0.0704	-38	-68
141 Tauri	6.3	3.75	2.6	22 23.9	19 5 35.7	- 6 30.9	-0.3647	0.5510	0.0528	+18	-41
i Geminorum	4.1	3.78	2.9	23 16.1	6 42.1	- 5 26.7	-1.2064	0.5511	0.0506	-58	-67
B. A. C. 1970	6.0	+3.75	- 3.3	+22 12.3	9 14.1	- 2 59.8	+0.0282	0.5513	+0.0456	+40	-17
3 Geminorum	5.6	3.77	3.3	23 7.7	9 18.3	- 2 55.7	-0.9877	0.5513	0.0455	-22	-67
6 Geminorum	6.3	3.76	3.6	22 55.7	10 30.4	- 1 46.0	-0.7149	0.5512	0.0431	- 3	-66
η Geminorum	3.5	3.75	3.8	22 32.0	11 42.1	- 0 36.7	-0.2280	0.5515	0.0408	+25	-31
μ Geminorum	3.2	3.75	4.6	22 33.6	15 26.2	+ 2 59.9	-0.1200	0.5514	0.0333	+32	-24
B. A. C. 2064	6.0	+3.77	- 4.8	+23 22.7	16 37.4	+ 4 8.7	-0.9847	0.5515	+0.0310	-22	-67
d Geminorum	5.2	3.70	6.9	21 52.2	20 4 41.7	- 8 11.0	+0.9116	0.5510	0.0068	+90	+36
B. A. C. 2238	5.8	3.74	7.1	23 42.6	4 52.2	- 8 0.9	-1.1247	0.5510	+0.0065	-34	-66
44 Geminorum	5.9	3.69	8.2	22 46.5	11 3.8	- 2 1.7	-0.0877	0.5504	-0.0059	+33	-20
NEPTUNE				21 53.0	11 11.0	- 1 54.7	+0.8986	0.5516	-0.0062	+90	+35
δ Geminorum	3.5	+3.64	- 9.3	+22 9.1	17 58.3	+ 4 39.2	+0.5154	0.5494	-0.0196	+74	+11
58 Geminorum	6.0	3.65	9.8	23 7.3	19 30.9	+ 6 8.7	-0.5933	0.5491	0.0226	+ 4	-55
B. A. C. 2455	6.4	3.59	9.8	21 43.2	21 7.7	+ 7 42.3	+0.9234	0.5488	0.0258	+90	+35
63 Geminorum	5.3	3.60	10.0	21 38.0	21 32.3	+ 8 6.0	+1.0080	0.5487	0.0266	+90	+41
B.D.+23°, 1744	6.4	3.62	10.5	23 5.0	23 53.8	+10 22.9	-0.6687	0.5483	0.0312	0	-62
B.D.+23°, 1780	6.3	+3.61	-11.1	+23 13.9	21 3 42.3	- 9 56.1	-0.9660	0.5475	-0.0386	-20	-67
B. A. C. 2544	6.3	3.58	11.2	22 37.0	4 50.5	- 8 50.1	-0.3283	0.5473	0.0408	+20	-37
82 Geminorum	6.3	3.58	11.7	23 22.1	7 16.1	- 6 29.3	-1.2682	0.5467	0.0454	-59	-67
μ <sup>1</sup> Cancri	6.2	3.51	13.0	22 53.9	15 39.5	+ 1 37.7	-1.1943	0.5446	0.0613	-43	-67
μ <sup>2</sup> Cancri	5.5	3.48	13.0	21 50.9	16 22.1	+ 2 18.9	-0.0727	0.5444	0.0626	+34	-25
Piazzi viii, 42	6.0	+3.42	-13.8	+21 2.3	22 22.1	+ 8 7.3	+0.4194	0.5426	-0.0735	+66	0

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## DECEMBER.

THE STAR'S				AT CONJUNCTION IN R. A.								Limiting Parallels.		
Name.	Mag.	Red'ns from 1907.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.			
		$\Delta\alpha$	$\Delta\delta$											
		<i>s</i>	<i>"</i>	<i>°</i>	<i>d</i>	<i>h</i>	<i>m</i>	<i>h</i>	<i>m</i>		<i>°</i>	<i>'</i>		
$\eta$ Cancr	5.4	+3.36	-14.4	+20 45.2	22	4	17.9	-10	8.4	+0.2675	0.5408	-0.0841	+55	-9
39 Cancr	6.5	3.32	14.8	20 19.9	7	51.9	-6	41.2	+0.4242	0.5396	0.0903	+66	0	
40 Cancr	6.5	3.32	14.8	20 17.8	7	54.4	-6	38.8	+0.4608	0.5396	0.0904	+69	0	
B. A. C. 2919	6.5	3.31	14.7	19 59.7	7	59.8	-6	33.6	+0.7871	0.5396	0.0905	+90	+19	
$\epsilon$ Cancr	6.3	3.31	14.7	19 52.2	8	2.3	-6	31.2	+0.9221	0.5396	0.0906	+90	+28	
B. A. C. 2991	6.1	+3.25	-15.1	+19 10.5	13	1.9	-1	41.1	+1.2200	0.5379	-0.0990	+90	+53	
8 Leonis	5.9	2.98	16.9	16 51.0	23	11	50.3	-3	35.4	+1.1252	0.5299	0.1345	+90	+39
B.D.+16°, 2077	6.3	2.82	17.8	16 12.3	24	2	15.5	+10	23.5	-0.2436	0.5252	0.1539	+25	-44
37 Leonis	5.5	2.74	17.6	14 11.3	7	52.0	-8	10.1	+1.1042	0.5235	0.1608	+90	+33	
42 Leonis	6.1	2.71	18.1	15 26.4	10	29.6	-5	37.3	-0.7053	0.5228	0.1638	0	-74	
<i>i</i> Leonis	5.8	+2.64	-18.1	+14 36.6	15	48.8	-0	27.6	-0.6767	0.5213	-0.1699	+1	-75	
$\omega$ Virginis	5.4	2.24	16.9	8 38.7	26	2	17.8	+9	0.7	-0.5587	0.5160	0.2008	+9	-72
$\nu$ Virginis	4.2	2.19	16.5	7 2.8	6	10.4	-11	13.5	+0.3988	0.5159	0.2033	+63	-16	
$\pi$ Virginis	4.6	2.11	16.3	7 7.7	14	1.7	-3	35.9	-1.3048	0.5160	0.2080	-47	-83	
B.D.+6°, 2543	6.5	2.09	16.0	6 4.4	15	32.2	-2	8.0	-0.4749	0.5162	0.2087	+13	-67	
$\epsilon$ Virginis	5.1	+1.99	-15.0	+3 49.6	27	0	12.3	+6	16.7	+0.1270	0.5171	-0.2128	+46	-31
Piazzi xii, 142	5.9	1.91	14.2	+2 21.8	9	32.5	-8	39.5	-0.3004	0.5188	0.2160	+22	-56	
80 Virginis	5.6	1.67	10.3	-4 55.5	28	14	30.6	-4	33.6	+1.1281	0.5294	0.2180	+85	+27
Piazzi xiii, 174	6.4	1.62	10.1	5 2.0	18	39.3	-0	32.6	+0.3373	0.5317	0.2172	+58	-20	
$\eta$ Virginis	6.5	1.62	9.5	6 22.6	20	48.2	+1	32.2	+1.3681	0.5328	0.2202	+84	+60	
Lalande 26147	6.5	+1.51	-8.6	-7 6.5	29	11	6.8	-8	36.5	-1.0199	0.5417	-0.2110	-21	-90
$\xi^1$ Libræ	5.7	1.38	5.7	11 31.2	30	3	57.5	+7	40.7	+0.0845	0.5543	0.1989	+39	-34
$\xi^2$ Libræ	5.7	1.38	5.8	11 2.2	5	2.5		+8	43.6	-0.6277	0.5552	0.1979	+1	-82
17 Libræ	6.4	1.37	5.8	10 47.0	5	42.2		+9	21.9	-1.0178	0.5558	0.1973	-24	-90
18 Libræ	5.9	1.36	5.8	10 46.3	6	0.6		+9	39.7	-1.0893	0.5561	0.1970	-29	-90
$\gamma$ Libræ	4.1	+1.30	-3.4	-14 28.8	22	5.0		+1	10.3	-0.3251	0.5698	-0.1785	+15	-58
Bradley 1987	6.5	1.25	3.2	14 44.8	31	1	27.3	+4	25.2	-0.6493	0.5728	0.1739	-3	-86
$\eta$ Libræ	5.5	1.26	3.0	15 22.7	1	43.7		+4	41.0	-0.0574	0.5731	0.1735	+28	-42
$\theta$ Libræ	4.4	1.25	2.2	16 27.4	5	49.6		+8	38.0	+0.3346	0.5767	0.1674	+50	-20
49 Libræ	5.4	1.17	2.5	16 15.6	8	34.8		+11	17.0	-0.3193	0.5792	0.1631	+13	-58
B.D.-17°, 4502	6.4	+1.20	-1.4	-18 5.6	12	29.9		-8	56.7	+0.8089	0.5827	-0.1566	+72	+13
B. A. C. 5408	6.4	+1.19	-1.3	-18 17.9	14	26.3		-7	4.7	+0.8020	0.5844	-0.1532	+72	+7

## OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1907.

Date.	THE STAR'S		IMMERSION.				EMERSION.				Duration of Oc- cultation.	
			Washington.		Angle from—		Washington.		Angle from—			
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.		
Jan.	1	$\delta$ Cancri	4.1	h m 4 58	h m 10 16	° 116	° 171	h m 6 13	h m 11 30	° 256	° 306	h m 1 14
	8	$\zeta$ Libræ	5.7	14 57	19 45	85	83	16 6	20 54	326	307	1 9
	9	Bradley 1987 †	6.5	10 24	15 9	71	121	11 9	15 54	333	20	0 45
	16	50 Aquarii	5.9	1 13	5 32	117	81	1 54	6 13	192	151	0 41
	17	$\psi$ Aquarii	4.6	0 45	5 0	91	68	1 50	6 5	212	177	1 5
	24	$m$ Tauri	5.0	8 53	12 40	103	48	10 2	13 48	249	195	1 8
	25	B. D. +19°, 1110	6.0	5 18	9 1	133	143	6 17	10 0	210	187	0 59
	25	$\chi$ Orionis	4.5	6 49	10 32	45	15	7 58	11 40	307	259	1 8
	25	$\chi$ Orionis †	4.7	12 18	16 0	70	18	13 10	16 52	294	246	0 52
	27	61 Geminorum	5.8	0 33	4 9	65	115	1 26	5 2	286	340	0 53
Feb.	30	34 Leonis	6.4	6 31	9 54	111	163	7 49	11 12	282	326	1 18
	31	Piazzi xi, 12	5.8	15 16	18 34	106	55	16 19	19 36	303	251	1 2
	22	15 Geminorum	6.5	8 25	10 18	43	354	9 20	11 12	323	269	0 54
	22	16 Geminorum	6.2	8 24	10 17	117	70	9 41	11 33	249	194	1 16
	23	56 Geminorum	5.2	9 57	11 45	91	38	11 12	13 0	290	234	1 15
Mar.	23	61 Geminorum	5.8	12 46	14 34	80	25	13 42	15 29	300	248	0 55
	24	B. D. +20°, 1976	6.3	1 58	3 44	34	87	2 34	4 20	323	17	0 36
	27	$\iota$ Leonis	5.3	10 49	12 22	69	54	11 45	13 17	347	314	0 55
	5	49 Libræ *	5.4	10 2	11 11	138	191	10 52	12 0	262	312	0 49
	7	B. A. C. 6125	6.2	13 56	14 57	99	143	15 4	16 4	286	321	1 7
	7	14 Sagittarii	5.6	17 46	18 46	93	98	19 10	20 9	276	262	1 23
	8	$\circ$ Sagittarii *	3.9	12 35	13 32	125	180	13 23	14 20	248	300	0 48
	8	B. A. C. 6561	6.4	15 57	16 54	67	104	17 4	18 0	301	326	1 6
	22	$\zeta$ Geminorum	4.0	12 2	12 4	111	55	13 3	13 4	266	213	1 0
	23	79 Geminorum	6.3	5 0	4 59	87	140	6 29	6 28	275	311	1 29
	23	85 Geminorum	5.2	12 11	12 9	88	32	13 14	13 11	300	245	1 2
	24	$\delta$ Cancri	4.1	10 53	10 47	128	82	12 6	12 0	270	216	1 13
	25	B. A. C. 3209	6.3	4 10	4 1	28	82	4 34	4 25	348	43	0 24
	30	Piazzi xiii, 174*	6.4	6 14	5 45	65	117	6 49	6 20	336	27	0 35
	Apr. 1	$\eta$ Libræ	5.5	10 59	10 21	118	165	12 0	11 23	289	331	1 2
	1	$\theta$ Libræ	4.4	16 41	16 3	127	115	17 57	17 18	271	243	1 15
	4	30 Sagittarii	6.2	14 24	13 34	130	175	15 20	14 30	246	285	0 56
	6	20 Capricorni	6.2	19 1	18 3	85	109	20 23	19 25	248	256	1 22
	17	$\chi$ Orionis †	4.5	12 44	11 3	106	57	13 36	11 55	256	212	0 52
	22	34 Leonis	6.4	15 24	13 23	72	19	16 8	14 8	330	278	0 45
	23	$\iota$ Leonis	5.3	7 22	5 18	159	208	8 12	6 9	242	287	0 51
	26	80 Virginis	5.6	15 38	13 21	107	75	16 49	14 32	307	265	1 11
	29	$\chi$ Ophiuchi	4.9	15 17	12 49	69	84	16 16	13 47	331	332	0 58
	May 26	$\theta$ Libræ	4.4	13 32	9 18	131	160	14 42	10 28	278	294	1 10
	27	B. A. C. 5746	6.2	18 16	13 57	94	77	19 31	15 12	285	254	1 15
June	29	Piazzi xix, 61	5.5	21 25	16 58	97	70	22 33	18 5	245	207	1 7
	23	$\chi$ Ophiuchi	4.9	15 38	9 33	58	68	16 26	10 21	341	340	0 48
	25	28 Sagittarii	5.6	20 53	14 40	42	14	21 44	15 30	309	274	0 50
July	28	B. D. -17°, 6389	6.5	17 2	10 38	96	144	18 5	11 40	241	283	1 2
	20	$\theta$ Libræ	4.4	13 16	5 26	169	201	13 58	6 8	241	266	0 42

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb, toward the east.

\* Whole occultation below the horizon of Washington.

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

## OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1907.

Date.	THE STAR'S		IMMERSION.				EMERSION.				Duration of Oc- cultation.	
			Washington.		Angle from—		Washington.		Angle from—			
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.		
July	21	B. A. C. 5746	6.2	h m 19 2	h m 11 7	° 102	° 75	h m 20 15	h m 12 20	° 274	° 236	h m 1 13
	23	Piazzi xix, 61	5.5	22 8	14 4	91	56	23 13	15 9	250	207	1 5
	27	♂ Aquarii	5.2	19 14	10 55	352	37	19 28	11 9	328	11	0 14
	28	Piazzi o, 1 †	6.0	17 56	9 34	112	163	18 40	10 17	208	258	0 43
	31	μ Ceti	4.3	22 17	13 43	24	76	23 10	14 35	283	334	0 53
Aug.	2	63 Tauri	5.7	23 2	14 19	127	182	23 37	14 54	191	246	0 35
	18	58 Ophiuchi	4.8	20 38	10 53	77	42	21 44	11 59	285	241	1 6
	19	28 Sagittarii	5.6	20 46	10 56	29	3	21 27	11 37	322	289	0 41
	22	B.D.—17°, 6389	6.5	17 28	7 27	92	137	18 33	8 32	243	281	1 5
Sept.	14	ξ Ophiuchi	4.4	19 46	8 14	53	22	20 40	9 8	317	279	0 54
	14	B. A. C. 5866 †	5.9	21 38	10 6	116	71	22 34	11 2	247	197	0 56
	16	Piazzi xix, 61	5.5	18 2	6 23	20	36	18 31	6 52	338	348	0 29
	20	♂ Aquarii	5.2	18 42	6 47	23	70	19 26	7 31	297	341	0 44
	20	B. A. C. 8214 †	6.5	4 51	16 54	12	321	5 24	17 27	300	249	0 33
	26	B. D. +17°, 750	6.2	23 14	10 55	42	96	0 10	11 51	277	332	0 56
	26	Mayer 177	6.1	7 35	19 14	113	60	8 42	20 21	231	175	1 7
Oct.	27	B. A. C. 1651 †	6.5	21 38	9 15	80	125	22 31	10 8	252	302	0 53
	27	Piazzi v, 125	6.1	4 46	16 22	124	148	5 50	17 26	209	195	1 4
	29	NEPTUNE	...	0 43	12 12	40	92	1 26	12 55	306	1	0 43
	1	B. A. C. 2991 †	6.1	0 57	12 18	95	140	1 50	13 10	272	321	0 52
	12	B. A. C. 6088	5.7	18 48	5 27	128	117	19 55	6 33	239	214	1 6
	15	η Capricorni	4.8	18 21	4 47	115	147	19 23	5 50	222	243	1 3
	21	85 Ceti	6.3	7 41	17 43	45	352	8 36	18 37	281	229	0 54
	23	♂ Tauri	4.3	8 31	18 24	98	43	9 36	19 29	245	191	1 5
	24	Mayer 198	6.3	0 54	10 44	48	104	2 0	11 50	272	326	1 6
	24	107 Tauri	6.5	2 45	12 36	98	149	4 2	13 52	224	256	1 16
	24	B. A. C. 1639	6.2	10 5	19 53	152	97	10 32	20 21	203	148	0 28
	26	♂ Geminorum	5.2	2 14	11 57	125	182	3 7	12 49	217	274	0 53
	28	39 Cancrī	6.5	6 21	15 55	43	94	7 11	16 45	336	16	0 50
	28	40 Cancrī	6.5	6 18	15 52	55	106	7 23	16 57	324	1	1 5
	28	B. A. C. 2919	6.5	6 27	16 1	127	177	7 49	17 23	253	280	1 22
	28	ε Cancrī	6.3	7 0	16 33	169	211	7 33	17 7	212	245	0 36
Nov.	9	URANUS	...	19 48	4 37	140	173	20 48	5 37	255	279	1 0
	16	Lalande 2632	6.5	4 2	12 22	0	320	4 40	12 59	301	347	0 37
	20	B.D.+19°, 811	6.2	8 8	16 12	110	54	9 14	17 18	237	181	1 6
	21	ζ Tauri	3.0	1 51	9 51	47	104	2 58	10 58	279	334	1 7
Dec.	23	♂ Geminorum	3.5	1 4	8 56	103	156	2 3	9 55	245	301	0 59
	24	Piazzi viii, 42	6.0	6 21	14 8	104	153	7 53	15 41	272	287	1 33
	10	56 Aquarii	6.1	22 18	5 4	106	108	23 15	6 1	198	186	0 58
	11	B.D.—10°, 6120	6.3	1 47	8 29	137	105	2 2	8 43	162	127	0 14
	17	♂ Tauri	3.9	23 9	5 28	83	137	0 11	6 29	232	287	1 1
	17	♂ Tauri	4.3	0 42	7 0	53	107	1 54	8 12	259	308	1 12
	20	♂ Geminorum	3.5	12 50	18 55	79	25	13 44	19 49	301	250	0 54
	28	Piazzi xiii, 174	6.4	12 2	17 35	65	90	12 44	18 17	2	347	0 42

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb, toward the east.

\* Whole occultation below the horizon of Washington. † Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

## FOR WASHINGTON MEAN NOON.

Date.	$k$	$i$	$\theta$	$L$	Date.	$k$	$i$	$\theta$	$L$
Jan. 0	0.851	45	185	31.5	July 4	0.273	117	17	27.4
5	0.899	37	180	28.3	9	0.187	129	21	22.2
10	0.931	30	175	26.2	14	0.105	142	27	14.7
15	0.956	24	168	25.4	19	0.039	157	41	6.3
20	0.974	19	160	25.7	24	0.011	163	94	1.8
25	0.988	13	148	27.0	Aug. 29	0.036	158	159	6.6
30	0.996	7	120	29.9	3	0.128	138	176	19.3
Feb. 4	0.997	6	28	34.5	8	0.253	119	184	35.7
9	0.983	15	359	41.7	13	0.430	98	189	52.8
14	0.943	28	347	51.6	18	0.627	75	195	65.6
19	0.854	45	340	63.1	23	0.805	52	202	69.3
24	0.702	66	336	70.7	28	0.928	31	210	63.1
Mar. 1	0.492	92	332	64.7	Sept. 2	0.984	14	220	52.5
6	0.269	118	328	49.9	7	0.998	5	310	43.0
11	0.096	144	320	18.6	12	0.984	14	7	35.8
16	0.011	168	288	2.3	17	0.964	22	18	31.1
21	0.024	162	187	4.4	22	0.938	29	22	28.3
26	0.101	143	163	15.9	27	0.907	35	23	27.3
31	0.204	126	158	25.5	Oct. 2	0.873	42	24	26.7
Apr. 5	0.309	113	155	30.7	7	0.832	48	24	27.5
10	0.406	102	153	32.1	12	0.784	55	23	29.5
15	0.478	92	152	32.6	17	0.721	64	21	32.8
20	0.551	84	151	33.0	22	0.640	74	21	37.3
25	0.624	76	151	34.1	27	0.528	87	21	42.0
30	0.695	67	151	36.3	Nov. 1	0.378	104	20	43.6
May 5	0.770	57	152	40.1	6	0.193	128	20	32.9
10	0.848	46	154	45.8	11	0.032	159	20	7.4
15	0.926	32	157	54.0	16	0.020	163	206	5.2
20	0.984	14	163	62.6	21	0.195	127	205	38.3
25	0.997	6	329	67.6	26	0.429	98	204	57.1
30	0.947	27	344	65.4	Dec. 1	0.623	76	203	54.4
June 4	0.852	45	350	58.0	6	0.755	60	200	45.7
9	0.743	61	356	49.9	11	0.839	47	196	36.9
14	0.636	74	1	42.9	16	0.897	37	192	31.5
19	0.539	86	5	38.0	21	0.933	30	186	28.2
24	0.448	96	9	34.4	26	0.959	23	180	25.9
29	0.359	106	13	31.2	31	0.977	17	172	24.9

## NOTATION.

$k$ =the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

$i$ =the angle between the Sun and Earth, as seen from the planet.

$\theta$ =the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

$L$ =the brilliancy of the disk. The unit of  $L$  is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

## FOR WASHINGTON MEAN NOON.

Date.	$k$	$i$	$\theta$	$L$	Date.	$k$	$i$	$\theta$	$L$
Jan. 0	0.224	123.4	196.9	216.2	July 4	0.941	28.1	175.0	51.7
5	0.268	117.6	195.8	218.3	9	0.949	26.1	178.1	51.2
10	0.309	112.5	194.4	214.3	14	0.956	24.2	181.3	50.6
15	0.348	107.8	192.7	206.5	19	0.962	22.2	184.6	50.1
20	0.383	103.5	190.8	197.0	24	0.969	20.3	188.0	49.6
25	0.415	99.8	188.8	186.3	Aug. 29	0.975	18.3	191.4	49.2
30	0.445	96.3	186.7	175.2	3	0.980	16.4	195.0	48.8
Feb. 4	0.474	93.0	184.4	164.6	8	0.984	14.5	198.6	48.5
9	0.501	89.9	182.0	154.4	13	0.988	12.6	202.2	48.3
14	0.526	87.0	179.5	145.1	18	0.991	10.6	206.1	48.0
19	0.550	84.2	177.0	136.4	23	0.994	8.7	210.8	47.8
24	0.573	81.6	174.4	128.4	28	0.996	6.9	215.7	47.7
Mar. 1	0.595	79.1	171.9	121.0	Sept. 2	0.998	5.1	224.0	47.6
6	0.616	76.7	169.5	114.2	7	1.000	3.4	238.0	47.5
11	0.636	74.3	167.1	107.9	12	1.000	2.6	269.3	47.5
16	0.656	72.0	164.9	102.6	17	1.000	2.4	330.3	47.4
21	0.674	69.7	162.9	97.6	22	1.000	3.3	350.3	47.4
26	0.691	67.6	161.3	92.9	27	0.998	5.0	2.6	47.5
31	0.708	65.5	159.8	88.5	Oct. 2	0.996	6.7	8.8	47.6
Apr. 5	0.725	63.4	158.3	84.7	7	0.994	8.5	12.2	47.8
10	0.741	61.3	156.9	81.2	12	0.992	10.2	13.7	47.9
15	0.756	59.3	155.8	78.0	17	0.989	11.9	15.1	48.1
20	0.771	57.3	155.0	75.0	22	0.986	13.6	15.1	48.3
25	0.785	55.3	154.6	72.3	27	0.983	15.4	15.2	48.7
30	0.799	53.3	154.4	69.8	Nov. 1	0.979	17.1	14.4	49.1
May 5	0.813	51.3	154.5	67.5	6	0.974	18.8	13.4	49.5
10	0.826	49.4	154.7	65.4	11	0.969	20.4	12.0	50.0
15	0.838	47.5	155.3	63.5	16	0.963	22.1	10.4	50.5
20	0.849	45.5	156.1	61.8	21	0.957	23.8	8.6	51.1
25	0.861	43.6	157.2	60.2	26	0.951	25.5	6.0	51.7
30	0.873	41.7	158.6	58.8	Dec. 1	0.945	27.1	3.8	52.4
June 4	0.884	39.8	160.2	57.5	6	0.939	28.8	1.3	53.1
9	0.894	37.9	162.1	56.3	11	0.932	30.4	358.8	54.0
14	0.904	35.9	164.2	55.2	16	0.924	32.1	356.2	55.0
19	0.914	33.9	166.6	54.2	21	0.916	33.7	353.8	56.0
24	0.924	32.0	169.1	53.3	26	0.907	35.4	351.4	57.1
July 29	0.933	30.0	171.9	52.4	31	0.898	37.1	349.1	58.3
4	0.941	28.1	175.0	51.7					

## NOTATION.

$k$  = the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

$i$  = the angle between the Sun and Earth, as seen from the planet.

$\theta$  = the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

$L$  = the brilliancy of the disk. The unit of  $L$  is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

## FOR WASHINGTON MEAN NOON.

Date.	$k$	$i$	$\theta$	$L$	Date.	$k$
		°	°			
Apr. 10	0.888	39.1	178.3	11.3	Jan. 0	0.927
20	0.893	38.1	176.6	14.2	10	0.919
30	0.902	36.5	175.3	17.9	20	0.912
May 10	0.913	34.3	174.5	22.9	30	0.905
20	0.929	31.1	174.3	29.5	Feb. 9	0.899
30	0.947	26.8	175.1	38.0	19	0.894
June 9	0.965	21.2	177.5	48.5	Mar. 1	0.890
19	0.984	14.5	183.4	59.7	11	0.887
29	0.996	6.8	202.4	69.7	21	0.885
July 9	0.998	4.7	299.7	75.4	31	0.885
19	0.989	12.1	336.8	74.8	Oct. 7	0.855
29	0.970	19.9	345.8	69.1	17	0.852
Aug. 8	0.947	26.7	349.8	60.1	27	0.852
18	0.923	32.2	351.7	50.7	Nov. 6	0.853
28	0.902	36.5	352.3	42.0	16	0.855
Sept 7	0.885	39.7	352.0	34.8	26	0.858
17	0.871	42.0	351.0	28.9	Dec. 6	0.863
27	0.861	43.7	349.6	24.1	16	0.869
Oct. 7	0.855	44.7	348.0	20.2	26	0.875

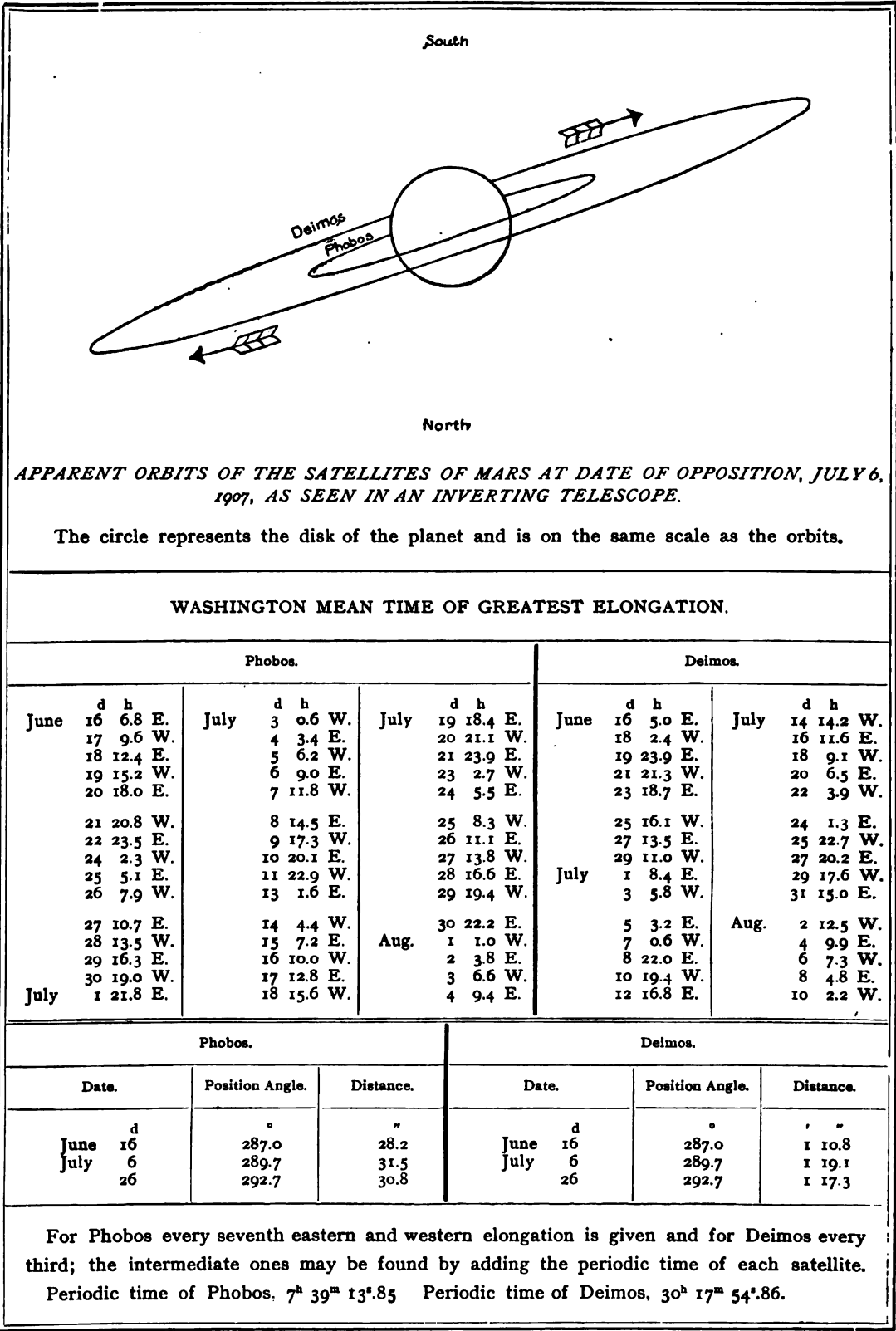
## NOTATION.

$k$  = the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

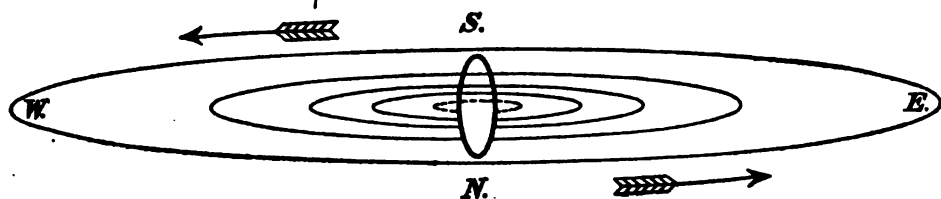
$i$  = the angle between the Sun and Earth, as seen from the planet.

$\theta$  = the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

$L$  = the brilliancy of the disk. The unit of  $L$  is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.







*APPARENT ORBITS OF THE SATELLITES OF JUPITER JANUARY 0, 1907, AS SEEN  
IN AN INVERTING TELESCOPE.*

(The vertical scale is three times the horizontal one.)

JUPITER will not be in opposition in 1907. In the latter months of the year the earth is very near the planes of the orbits of the satellites, the apparent orbits then approximating straight lines.

In the above diagram the central vertical ellipse represents the disk of Jupiter, elongated three times in the vertical direction, and the dotted ellipse represents the orbit of Satellite V. The object of the figure is to facilitate the identification of satellites in cases where the diagrams of configurations do not suffice. For example, if two satellites are seen together a reference to the above figure will show which is the inner and which the outer one of the pair.

The ephemeris of the four outer satellites of Jupiter is given on pages 490-511, each month occupying two pages, which contain respectively the times of the phenomena and the diagrams of the configurations. The latter are given for each day, Jupiter being represented by a light disk, ○, in the center of the page, and the relative positions of the satellites at the Washington time stated above the diagrams being indicated by dots. The designation of each satellite is shown by a numeral placed to the right or left of the dot according as the motion of the satellite at the instant in question is toward the east or toward the west—the motion being always toward the numeral. In constructing the diagrams the latitudes of the satellites are always considered zero, except where two or more of them chance to be at nearly the same distance from the planet, when they are placed one above the other according to their apparent latitudes. If, at the epoch of any configuration, one or more satellites are projected on the disk of the planet, that phenomenon is indicated by a light disk, ○, at the left-hand side of the page; and if any satellites are invisible on account of being occulted behind the disk of the planet, or eclipsed by its shadow, that circumstance is indicated by a dark disk, ●, at the right-hand side of the page. In both cases, the annexed numerals serve to point out which satellites are thus rendered invisible.

When an observation is made at a different hour from that for which the diagram is constructed, the place of the satellite may be found by transferring its given position to the above diagram, and estimating its motion during the elapsed interval by means of the following table of—

*MEAN SYNODIC PERIODS OF THE SATELLITES.*

[illegible]

## SATELLITE V.

WASHINGTON MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

Jan.	d	h	E.	Apr.	d	h	E.	Jan.	d	h	W.	Apr.	d	h	W.
	10	14.9	E.		10	7.2	E.		10	8.9	W.		10	13.2	W.
	20	14.0	E.						20	8.0	W.				
Feb.	30	13.1	E.	Nov.	1	14.4	E.	Feb.	30	7.1	W.	Nov.	1	8.4	W.
	9	12.2	E.		11	13.6	E.		9	6.2	W.		11	7.6	W.
	19	11.3	E.		21	12.7	E.		19	5.4	W.		21	6.7	W.
Mar.	1	10.5	E.	Dec.	1	11.8	E.	Mar.	1	16.5	W.	Dec.	1	5.8	W.
	11	9.6	E.		11	10.9	E.		11	15.6	W.		11	16.9	W.
	21	8.8	E.		21	10.0	E.		21	14.8	W.		21	16.0	W.
	31	8.0	E.		31	9.1	E.		31	14.0	W.		31	15.0	W.

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

## SATELLITE I.

Jan.		h	m	Mar.		h	m	June		h	m	Oct.		h	m
	1	17	58.7		22	8	26.0		10	0	47.1		13	18	15.0
	3	12	24.7		24	2	54.9		11	19	17.4		15	12	43.9
	5	6	50.7		25	21	23.8		13	13	47.7		17	7	12.8
	7	1	16.7		27	15	52.8		15	5	18.2		19	1	41.6
	8	19	42.8		29	10	22.0						20	20	10.3
	10	14	8.9		31	4	51.1						22	14	39.0
	12	8	35.0	Apr.	1	23	20.3						24	9	7.6
	14	3	1.2		3	17	49.5						26	3	36.2
	15	21	27.4		5	12	18.8						27	22	4.8
	17	15	53.7		7	6	48.1						29	16	33.3
	19	10	20.0		9	1	17.5						31	11	1.7
	21	4	46.4		10	19	46.9	Aug.	16	7	58.3	Nov.	2	5	30.1
	22	23	12.8		12	14	16.4		18	2	28.4		3	23	58.4
	24	17	39.3		14	8	46.0		19	20	58.5		5	18	26.6
	26	12	5.9		16	3	15.6						7	12	54.8
	28	6	32.5		17	21	45.2		21	15	28.6		9	7	22.9
	30	0	59.2		19	16	14.8		23	9	58.5		11	1	51.0
Feb.	31	19	26.0		21	10	44.5		25	4	28.5		12	20	19.0
	2	13	52.8		23	5	14.2		26	22	58.5		14	14	46.9
	4	8	19.7		24	23	43.9		28	17	28.4		16	9	14.7
	6	2	46.7		26	18	13.7		30	11	58.3		18	3	42.5
	7	21	13.8		28	12	43.5	Sept.	1	6	28.2		19	22	10.2
	9	15	40.9		30	7	13.4		3	0	58.1		21	16	37.9
	11	10	8.1	May	2	1	43.4		4	19	27.9		23	11	5.5
	13	4	35.4		3	20	13.3		6	13	57.7		25	5	33.0
	14	23	2.8		5	14	43.3		8	8	27.4		27	0	0.5
	16	17	30.2		7	9	13.3		10	2	57.1		28	18	27.9
	18	11	57.7		9	3	43.3		11	21	26.8		30	12	55.2
	20	6	25.3		10	22	13.4		13	15	56.5	Dec.	2	7	22.5
	22	0	53.1		12	16	43.4		15	10	26.1		4	1	49.7
	23	19	20.8		14	11	13.5		17	4	55.7		5	20	16.8
	25	13	48.6		16	5	43.6		18	23	25.3		7	14	43.8
	27	8	16.6		18	0	13.8		20	17	54.8		9	9	10.8
Mar.	1	2	44.6		19	18	43.9		22	12	24.3		11	3	37.7
	2	21	12.7		21	13	14.1		24	6	53.8		12	22	4.6
	4	15	40.8		23	7	44.3		26	1	23.2		14	16	31.4
	6	10	9.0		25	2	14.5		27	19	52.6		16	10	58.0
	8	4	37.3		26	20	44.7		29	14	21.8		18	5	24.7
	9	23	5.6		28	15	14.9	Oct.	1	8	51.1		19	23	51.3
	11	17	34.0		30	9	45.1		3	3	20.4		21	18	17.8
	13	12	2.5	June	1	4	15.5		4	21	49.6		23	12	44.3
	15	6	31.1		2	22	45.8		6	16	18.8		25	7	10.7
	17	0	59.7		4	17	16.1		8	10	47.9		27	1	37.1
	18	19	28.4		6	11	46.4		10	5	17.0		28	20	3.4
	20	13	57.2		8	6	16.8		11	23	46.0		30	14	29.6

## WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

## SATELLITE II.

	h	m		h	m		h	m		h	m
Jan.	4	4 10.1	Mar.	26	19 41.4	June	16	15 8.6	Oct.	12	1 33.0
	7	17 16.8		30	8 59.6		20	4 33.2		15	14 54.4
	11	6 23.8	Apr.	2	22 18.3					19	4 14.3
	14	19 31.1		6	11 37.4					22	17 34.8
	18	8 38.6		10	0 57.0					26	6 53.7
	21	21 46.6		13	14 16.9					29	20 13.3
	25	10 55.0		17	3 37.3				Nov.	2	9 31.3
	29	0 3.9		20	16 58.0	Aug.	16	3 17.3		5	22 49.8
Feb.	1	13 13.2		24	6 19.2		19	16 42.7		9	12 6.7
	5	2 23.1		27	19 40.6		23	6 7.1		13	1 24.2
	8	15 33.6	May	1	9 2.4		26	19 32.3		16	14 39.9
	12	4 44.5		4	22 24.5		30	8 56.4		20	3 56.1
	15	17 56.0		8	11 46.8	Sept.	2	22 21.3		23	17 10.7
	19	7 8.2		12	1 9.6		6	11 45.0		27	6 25.8
	22	20 20.9		15	14 32.5		10	1 9.6		30	19 39.3
	26	9 34.3		19	3 55.8		13	14 32.9	Dec.	4	8 53.1
Mar.	1	22 48.3		22	17 19.1		17	3 57.0		7	22 5.3
	5	12 2.8		26	6 42.8		20	17 19.7		11	11 17.8
	9	1 17.9		29	20 6.6		24	6 43.3		15	0 28.8
	12	14 33.5	June	2	9 30.7		27	20 5.4		18	13 40.0
	16	3 49.6		5	22 54.8	Oct.	1	9 28.4		22	2 49.9
	19	17 6.4		9	12 19.3		4	22 49.9		25	16 0.1
	23	6 23.6		13	1 43.7		8	12 12.2		29	5 9.2

## SATELLITE III.

	h	m		h	m		h	m		h	m
Jan.	3	16 27.8	Mar.	30	12 2.0				Oct.	10	9 50.9
	10	19 44.2	Apr.	6	16 8.1					17	13 59.7
	17	23 3.3		13	20 18.2					24	18 5.2
	25	2 24.8		21	0 31.1					31	22 7.6
Feb.	1	5 50.0		28	4 47.0	Aug.	13	23 13.0	Nov.	8	2 5.6
	8	9 19.7	May	5	9 4.8		21	3 38.3		15	5 58.9
	15	12 54.2		12	13 24.8		28	8 2.7		22	9 48.0
	22	16 34.1		19	17 46.7	Sept.	4	12 25.7		29	13 32.1
Mar.	1	20 18.5		26	22 10.4		11	16 47.8	Dec.	6	17 11.7
	9	0 8.1	June	3	2 36.1		18	21 7.3		13	20 46.6
	16	4 1.7		10	7 2.4	Oct.	26	1 24.7		21	0 17.6
	23	7 59.7		17	11 29.7		3	5 39.3		28	3 43.8

## SATELLITE IV.

	h	m		h	m		h	m		h	m
Jan.	7	10 16.7	Mar.	31	19 9.7				Oct.	19	20 34.7
	24	0 38.7	Apr.	17	14 4.5	Aug.	13	12 59.7	Nov.	5	14 57.5
Feb.	9	15 46.9	May	4	9 38.4		30	9 32.2		22	8 25.6
	26	7 53.7		21	5 42.9	Sept.	16	5 42.7	Dec.	9	0 54.8
Mar.	15	1 2.7	June	7	2 7.8	Oct.	3	1 26.5		25	16 23.1

## WASHINGTON MEAN TIME.

## JANUARY.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s		
1	16	50		I.*	11	12	35		I.*	21	20	22		II.	22	0	22	6	II.	
19	12	35		I.		12	57		I.*		0	54		I.		0	54		I.	
2	7	50		II.*	12	7	26		I.*		1	32		I.		1	32		I.	
	8	7		II.*		10	5	0	II.		3	11		I.		3	11		I.	
	10	40				23	13													
	10	57		II.*	13	0	3		II.		3	49		I.		3	49		I.	
	14	8		I.*		2	3		II.		22	4		I.		22	4		I.	
	14	17		I.*		2	53		II.		23	0	57	47	I.		23	0	57	47
	16	25		I.*		4	44		I.		14	39		II.*		14	39		II.*	
	16	34		I.*		5	8		I.		15	58		II.*		15	58		II.*	
3	11	16		I.*		7	1		I.*		17	29		II.		17	29		II.	
	13	41	21	I.*		7	26		I.*		18	49		II.		18	49		II.	
	14	58		III.*		1	53		I.		19	21		I.		19	21		I.	
	18	36	40	III.		4	33	50	I.		20	0		I.		20	0		I.	
4	2	45		II.		8	4		III.*		21	38		I.		21	38		I.	
	5	54	37	II.*		9	50		III.*		22	18		I.		22	18		I.	
	8	34		I.*		11	5		III.*		23	50		IV.		23	50		IV.	
	8	45		I.*		12	54		III.*		24	1	28	IV.		24	1	28	IV.	
	10	51		I.*		18	6		II.		6	1	32	IV.*		6	1	32	IV.*	
	11	2		I.*		21	47	5	II.		7	59	17	IV.*		7	59	17	IV.*	
5	5	42		I.*		23	10		I.		16	31		I.*		16	31		I.*	
	8	10	0	I.*		23	37		I.		19	26	39	I.		19	26	39	I.	
	20	58		II.		15	1	27	I.		25	0	54	III.		25	0	54	III.	
	21	26		II.		1	54		I.		6	39	38	III.*		6	39	38	III.*	
	23	48		II.		17	9		IV.*		9	30		II.*		9	30		II.*	
6	0	16		II.		18	43		IV.		13	39	39	II.*		13	39	39	II.*	
	3	0		I.		20	19		I.		13	47		I.*		13	47		I.*	
	3	14		I.		21	23		IV.		14	29		I.*		14	29		I.*	
	5	17		I.		23	2	35	I.		16	4		I.*		16	4		I.*	
	5	31		I.*		23	20		IV.		16	46		I.		16	46		I.	
7	0	8		I.		16	12	21	II.*		26	10	57	I.*		26	10	57	I.*	
	2	38	48	I.		13	21		II.*		13	55	24	I.*		13	55	24	I.*	
	4	48		III.		15	11		II.*		3	49		II.		3	49		II.	
	5	51		III.*		16	12		II.*		5	18		II.		5	18		II.	
	7	48		III.*		17	36		I.		6	39		II.*		6	39		II.*	
	8	54		III.*		18	6		I.		8	9		II.*		8	9		II.*	
	9	32		IV.*		19	53		I.		8	14		I.*		8	14		I.*	
	11	2		IV.*		20	23		I.		8	58		I.*		8	58		I.*	
	12	2	38	IV.*		17	14	45	I.*		10	31		I.*		10	31		I.*	
	13	41	50	IV.*		17	31	25	I.		11	15		I.*		11	15		I.*	
	15	52		II.*		21	33		III.		28	5	24	I.		28	5	24	I.	
	19	12	6	II.		18	2	38	III.		8	24	18	I.*		8	24	18	I.*	
	21	26		I.		7	14		III.*		14	48		III.*		14	48		III.*	
	21	42		I.		11	4	36	II.*		17	48		III.		17	48		III.	
	23	43		I.		12	2		I.*		17	50		III.		17	50		III.	
8	0	0		I.		12	34		I.*		20	56		III.		20	56		III.	
	18	34		I.		14	19		I.*		22	39		II.		22	39		II.	
	21	7	31	I.		14	52		I.*		29	2	40	I.		29	2	40	I.	
9	10	5		II.*		19	9	12	I.*		2	57	10	II.		2	57	10	II.	
	10	45		II.*		12	0	9	I.*		3	26		I.		3	26		I.	
	12	55		II.*		20	1	30	II.		4	57		I.		4	57		I.	
	13	35		II.*		2	40		II.		5	43		I.		5	43		I.	
	15	52		I.*		4	20		II.		23	51		I.		23	51		I.	
	16	11		I.*		5	31		II.		30	2	53	6		30	2	53	6	
	18	9		I.		6	28		I.*		16	59		I.		16	59		I.	
	18	28		I.		7	3		I.*		18	36		II.		18	36		II.	
	18	30		I.*		8	45		I.*		19	49		II.		19	49		II.	
10	13	0		I.*		9	20		I.*		21	7		I.		21	7		I.	
	15	36	18	III.		21	3	38	I.		21	27		II.		21	27		II.	
	18	14		III.		6	29	1	I.*		21	55		I.		21	55		I.	
	22	37	32	III.					III.*		23	24		I.		23	24		I.	
11	4	59		II.		11	24		III.*		31	0	12	I.		31	0	12	I.	
	8	29	36	II.*		13	49		III.*		18	18		I.		18	18		I.	
	10	18		I.*		14	24		III.*		21	22	0	I.		21	22	0	I.	
	10	40		I.*		16	54		III.*											

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

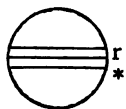
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

WASHINGTON MEAN TIME.

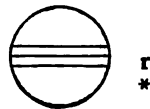
JANUARY.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

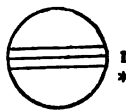
I.



III.



II.



IV.



*Configurations at 11<sup>h</sup> 30<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.			
1	4'	3'	'1	○	'2			
2	4'	'3	2'	○	1'			
3	4'	'2	'3	○				'1 ●
4	'4		1'	○	'2	'3		
5	'4			○	'1	2'	3'	
6		'42'	1'	○		3'		
7			'3	○	'4	'1		
8		3'	'1	○	'2	'4		
9	○ 2'	'3		○	1'		'4	
10		'2	'3	○			'4	
11	○ 1'			○	'2	'3		'4
12				○	'1	2'	'3	4'
13		2'	1'	○		3'	4'	
14		'2	3'	○	'1	4'		
15		3'	'1	○	4'	'2		
16		'3	4'	○	2'	1'		
17		4'	'2	○	'3	'1		
18	4'			○	1'' 2'	'3		
19	4'			○	2'	'3		'1 ●
20	'4		2'	○		3'		
21	○ 3'	'4	'2	○	'1			
22		'4	3'	○	'2			
23		'3	'4	○	2'	1'		
24		2'	'3	○	'4			
25				○	1'	'3	'4	'2 ●
26				○	2'	'3	'4	'1 ●
27		2'	1'	○		3'		'4
28		'2		○	3'	'1		4'
29		3'	1'	○	'2			4'
30		'3		○	2'	'1	4'	
31		'3	'1	○	4'			

## WASHINGTON MEAN TIME.

## FEBRUARY.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	4	20		III.	10	8	33		II.*	19	8	58		III.*	20	5	17		III.*
7	20			III.*	10	33			II.*	9	11			I.*	10	21			I.*
7	42	53		III.*	11	23			II.*	10	21			I.*	10	42	33		II.*
7	50			IV.*	11	48			I.*	10	42	33		II.*	11	28			I.*
9	33			IV.*	12	47			I.*	11	28			I.*	11	28			Sh.
10	40	26		III.*	13	25			II.*	20	5	17		I.	11	28			Sh.
11	48			II.*	14	5			I.*	8	39	38		I.*	10	21			Ec.
15	21			IV.*	15	4			I.*	21	0	11		II.	11	28			Tr.
15	34			I.*	11	9	0		I.*	2	30			II.	11	28			Sh.
16	14	43		II.*	12	15	12		I.*	2	32			I.	11	28			Tr.
16	24			I.	21	47			III.	3	2			II.	11	28			Tr.
17	34			IV.	12	0	48		III.	3	39			I.	11	28			Sh.
17	50			I.	1	49			III.	4	49			I.	11	28			Tr.
18	41			I.	3	19			II.	5	22			II.	11	28			Sh.
2	12	44		I.*	4	57			III.	5	57			I.	11	28			Sh.
15	50	47		I.*	6	15			I.*	23	45			I.	11	28			Ec.
3	6	10		II.*	7	16			I.*	22	3	8	35	I.	11	28			Ec.
7	55			II.*	8	7	23		II.*	15	3			III.	11	28			Ec.
9	0			II.*	8	32			I.*	18	5			III.	11	28			Ec.
10	0			I.*	9	33			I.*	18	56			II.	11	28			Ec.
10	47			II.*	13	3	27		I.	19	43	32		III.	11	28			Ec.
10	52			I.*	6	44	3		I.*	20	59			I.	11	28			Tr.
12	17			I.*	21	45			II.	22	8			I.	11	28			Sh.
13	10			I.*	23	52			II.	22	44	24		III.	11	28			Ec.
4	7	11		I.*	14	0	35		II.	23	16			I.	11	28			Tr.
10	19	42		I.*	0	42			I.	23	16			II.	11	28			Ec.
18	15			III.	1	44			I.	0	26			I.	11	28			Sh.
21	16			III.	2	43			II.	18	12			I.	11	28			Ec.
21	49			III.	2	59			I.	21	37	25		I.	11	28			Ec.
5	0	56		III.	4	2			I.	24	13	26		II.*	11	28			Tr.
0	58			II.	21	54			I.	15	27			I.	11	28			Tr.
4	27			I.	15	1	12	59	I.	15	49			II.	11	28			Sh.
5	21			I.	11	23			III.*	16	16			II.	11	28			Tr.
5	32	15		II.	14	25			III.*	16	37			I.	11	28			Sh.
6	4			I.*	15	42	47		III.	17	44			I.	11	28			Tr.
7	38			I.*	16	31			II.	18	41			II.	11	28			Sh.
6	1	38		I.	18	42	34		III.	18	54			I.	11	28			Sh.
4	48	32		I.	19	9			I.	25	12	40	24	I.*	11	28			Ec.
19	21			II.	20	13			I.	16	6	24		I.	11	28			Ec.
21	14			II.	21	44	58		II.	26	5	4		III.	11	28			Tr.
22	11			II.	21	26			I.	6	54			IV.*	11	28			Ec.
22	54			I.	22	31			I.	8	6			III.*	11	28			Tr.
23	50			I.	16	16	22		I.	8	9			II.*	11	28			Ec.
7	0	5		II.	19	41	49		I.	8	53			IV.*	11	28			Ec.
1	11			I.	17	10	58		II.*	9	48			III.*	11	28			Sh.
2	7			I.	13	11			II.*	9	54			I.*	11	28			Tr.
20	5			I.	13	37			I.*	11	5			I.*	11	28			Tr.
23	17	27		I.	13	48			II.*	12	11			I.*	11	28			Tr.
8	7	49		III.*	14	42			I.*	12	59			III.*	11	28			Sh.
10	50			III.*	15	54			I.	13	17	45		II.*	11	28			Ec.
11	42	44		III.*	16	3			II.	13	23			I.*	11	28			Sh.
14	8			II.*	16	59			I.	18	4	31		IV.	11	28			Ec.
14	41	24		III.*	23	23			IV.	20	32	3		IV.	11	28			Ec.
17	21			I.	18	1	16		IV.	27	7	8		I.*	11	28			Ec.
18	18			I.	9	20			IV.*	10	35	16		I.*	11	28			Ec.
18	49	49		II.	10	49			I.*	28	2	41		II.	11	28			Tr.
19	38			I.	11	47			IV.*	4	22			I.	11	28			Tr.
20	36			I.	14	10	46		I.*	5	8			II.	11	28			Sh.
9	14	32		I.*	19	1	24		III.	5	31			II.	11	28			Tr.
14	53			IV.*	4	25			III.	5	34			I.	11	28			Sh.
16	41			IV.	5	43			II.	6	39			I.*	11	28			Tr.
17	46	15		I.	5	49			III.	7	52			I.*	11	28			Sh.
10	0	2	44	IV.	8	4			I.*	8	0			II.*	11	28			Sh.
2	16	17		IV.															

Norz.—In, denotes ingress; Eg, egress; Dis, disappearance; Re, reappearance; Ec, eclipse.

Oc, denotes occultation; Tr, transit of the satellite; Sh, transit of the shadow; \* Visible at Washington.

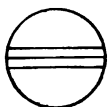
[Eph o:]

WASHINGTON MEAN TIME.

FEBRUARY.

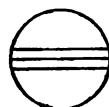
*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

I.



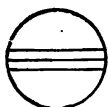
r  
\*

III.



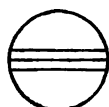
d  
\* r  
\*

II.



r  
\*

IV.



d  
\* r  
\*

*Configurations at 10<sup>h</sup> 30<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.			
1		0		4 <sup>h</sup> 2	○	I'		3 <sup>h</sup> ●
2			4'	'I	○	'2	'3	
3	○ I'	4'		2'	○		3'	
4	4'		'2		○	'I	3'	
5	4'		3'	'I	○	'2		
6	'4	3'			○	4 <sup>h</sup> 1		
7	'4		'3 2' I'		○			
8		'4	'2		○	I'		3 <sup>h</sup> ●
9			'I '4		○	'2	'3	
10	○ 2'				○	I'	'4 3'	
11		'2			○	3'	'4	'I●
12		3' I'			○	'2		'4
13		3'			○	'I 2'		'4
14		'3 2' I'			○			4'
15		'2 '3			○	I'		4'
16		'I			○	'2 '3 4'		
17					○	2' I' 4'	3'	
18		'2 4'	'I		○	3'		
19		4' 3'	I'		○			'2●
20	4'	3'			○	'I 2'		
21	4'	'3 2' I'			○			
22	'4	'2 '3			○	'I		
23	'4	'I			○	'2 '3		
24	'4				○	2' I'	'3	
25		2''4	'I		○	3'		
26	○ I'		3'		○	'4		'2●
27		3'			○	2' '4		'I●
28		'3	4 <sup>h</sup> 1		○		'4	

## WASHINGTON MEAN TIME.

## MARCH.

d	h	m	s				d	h	m	s				d	h	m	s			
1	1	36		I.	Oc.	Dis.	10	22	45		I.	Sh.	Eg.	21	13	2		II.*	Sh.	In.
	5	4	14	I.	Ec.	Re.		23	58		II.	Sh.	Eg.		13	14		II.	Tr.	Eg.
	18	47		III.	Oc.	Dis.	11	16	25		I.	Oc.	Dis.		13	37		I.	Sh.	Eg.
	21	23		II.	Oc.	Dis.		19	57	45	I.	Ec.	Re.		15	55		II.	Sh.	Eg.
	21	50		III.	Oc.	Re.	12	12	40		III.*	Tr.	In.	22	7	17		I.*	Oc.	Dis.
	22	50		I.	Tr.	In.		13	8		II.*	Oc.	Dis.		10	51	19	I.*	Ec.	Re.
	23	43	52	III.	Ec.	Dis.		13	39		I.*	Tr.	In.	23	4	30		I.	Tr.	In.
2	0	3		I.	Sh.	In.		14	56		I.	Sh.	In.		4	58		II.	Oc.	Dis.
	1	7		I.	Tr.	Eg.		15	44		III.	Tr.	Eg.		5	48		I.	Sh.	In.
	2	21		I.	Sh.	Eg.		15	56		I.	Tr.	Eg.		6	27		III.	Oc.	Dis.
	2	35	22	II.	Ec.	Re.		17	13		I.	Sh.	Eg.		6	47		I.*	Tr.	Eg.
	2	45	49	III.	Ec.	Re.		17	48		III.	Sh.	In.		8	6		I.*	Sh.	Eg.
	20	4		I.	Oc.	Dis.		18	28	18	II.	Ec.	Re.		9	28		IV.*	Tr.	In.
	23	33	5	I.	Ec.	Re.		21	0		III.	Sh.	Eg.		9	32		III.*	Oc.	Re.
3	15	57		II.	Tr.	In.	13	10	54		I.*	Oc.	Dis.		10	21	19	II.*	Ec.	Re.
	17	18		I.	Tr.	In.		14	26	39	I.	Ec.	Re.		11	43		IV.*	Tr.	Eg.
	18	28		II.	Sh.	In.	14	7	47		II.*	Tr.	In.		11	44	33	III.*	Ec.	Dis.
	18	32		I.	Sh.	In.		8	7		I.*	Tr.	In.		14	49	37	III.	Ec.	Re.
	18	47		II.	Tr.	Eg.		9	24		I.*	Sh.	In.		21	21		IV.	Sh.	In.
	19	35		I.	Tr.	Fg.		10	24		II.*	Sh.	In.	24	0	13		IV.	Sh.	Eg.
	20	49		I.	Sh.	Eg.		10	24		I.*	Tr.	Eg.		1	46		I.	Oc.	Dis.
	21	20		II.	Sh.	Eg.		10	37		II.*	Tr.	Eg.		5	20	10	I.	Ec.	Re.
4	14	32		I.	Oc.	Dis.		11	42		I.*	Sh.	Eg.		22	59		I.	Tr.	In.
	18	2	4	I.	Ec.	Re.		13	16		II.*	Sh.	Eg.		23	48		II.	Tr.	In.
5	8	49		III.*	Tr.	In.	15	2	8		IV.	Oc.	Dis.	25	0	17		I.	Sh.	In.
	10	38		II.*	Oc.	Dis.		5	22		IV.	Oc.	Re.		1	16		I.	Tr.	Eg.
	11	46		I.*	Tr.	In.		8	55	38	I.	Oc.	Dis.		2	22		II.	Sh.	In.
	11	52		III.*	Tr.	Eg.		12	7	3	I.*	Ec.	Re.		2	34		II.	Tr.	Eg.
	13	0		I.*	Sh.	In.		14	47	9	IV.*	Ec.	Dis.		2	35		I.	Sh.	Eg.
	13	48		III.*	Sh.	In.		2	24		IV.	Ec.	Re.		5	15		II.	Sh.	Eg.
	14	3		I.*	Tr.	Eg.	16	2	30		II.	Oc.	Dis.		20	15		I.	Oc.	Dis.
	15	18		I.	Sh.	Eg.		2	36		III.	Oc.	Dis.		23	49	9	I.	Ec.	Re.
	15	53	0	II.	Ec.	Re.		3	53		I.	Tr.	In.	26	17	27		I.	Tr.	In.
	16	59		III.	Sh.	Eg.		4	53		I.	Sh.	In.		18	16		II.	Oc.	Dis.
6	9	0		I.*	Oc.	Dis.		5	34		I.	Tr.	Eg.		18	45		I.	Sh.	In.
	12	30	57	I.*	Ec.	Re.		6	11		III.	Oc.	Re.		19	45		I.	Tr.	Eg.
	15	56		IV.	Tr.	In.		7	44	35	I.	Sh.	Eg.		20	35		III.	Tr.	In.
	18	0		IV.	Tr.	Eg.		7	45	57	III.*	Ec.	Dis.		21	3		I.	Sh.	Eg.
7	3	20		IV.	Sh.	In.		10	48	38	II.*	Ec.	Re.		23	39	2	II.	Ec.	Re.
	5	13		II.	Tr.	In.		23	51		III.*	Ec.	Re.		23	41		III.	Tr.	Eg.
	6	1		IV.	Sh.	Eg.	17	3	24	28	I.	Oc.	Dis.	27	1	48		III.	Sh.	In.
	6	14		I.	Tr.	In.		21	4		I.	Ec.	Re.		5	3		III.	Sh.	Eg.
	7	29		I.*	Sh.	In.		21	5		I.	Tr.	In.		14	44		I.	Oc.	Dis.
	7	46		II.*	Sh.	In.		22	22		II.	Tr.	In.		18	18	2	I.	Ec.	Re.
	8	3		II.*	Tr.	Eg.		22	21		I.	Sh.	In.		11	56		I.*	Tr.	In.
	8	31		I.*	Tr.	Eg.		23	21		I.	Tr.	Eg.	28	13	2		II.	Tr.	In.
	9	47		I.*	Sh.	Eg.		23	44		II.	Sh.	In.		13	14		I.	Sh.	In.
	10	38		II.*	Sh.	Eg.		23	56		II.	Tr.	Eg.		14	13		I.	Tr.	Eg.
8	3	29		I.	Oc.	Dis.	18	0	40		I.	Sh.	Eg.		15	32		I.	Sh.	Eg.
	6	59	56	I.*	Ec.	Re.		2	36		II.	Sh.	Eg.		15	40		II.	Sh.	In.
	22	36		III.	Oc.	Dis.		18	20		I.	Oc.	Dis.		15	52		II.	Tr.	Eg.
	23	53		II.	Oc.	Dis.		21	53	27	I.	Ec.	Re.		18	33		II.	Sh.	Eg.
9	0	42		I.	Tr.	In.	19	15	33		I.	Tr.	In.	29	9	13		I.*	Oc.	Dis.
	1	40		III.	Oc.	Re.		15	41		II.	Oc.	Dis.		12	47	0	I.*	Ec.	Re.
	1	58		I.	Sh.	In.		16	36		III.	Tr.	In.	30	6	25		I.	Tr.	In.
	2	59		I.	Tr.	Eg.		16	50		I.	Sh.	In.		7	34		II.*	Oc.	Dis.
	3	44	30	III.	Ec.	Dis.		17	50		I.	Tr.	Eg.		7	43		I.*	Sh.	In.
	4	16		I.	Sh.	Eg.		19	8		I.	Sh.	Eg.		8	43		I.*	Tr.	Eg.
	5	10	38	II.	Ec.	Re.		19	40		III.	Tr.	Eg.		10	1		I.*	Sh.	Eg.
	6	47	30	III.*	Ec.	Re.		21	3	38	II.	Ec.	Re.		10	29		III.*	Oc.	Dis.
	21	57		I.	Oc.	Dis.		21	48		III.	Sh.	In.		12	56	43	II.	Ec.	Re.
10	1	28	47	I.	Ec.	Re.	20	1	1		III.	Sh.	Eg.		13	35		III.	Oc.	Re.
	18	30		II.	Tr.	In.		12	49		I.*	Oc.	Dis.		15	44	37	III.	Ec.	Dis.
	19	10		I.	Tr.	In.		16	22	20	I.	Ec.	Re.		18	50	41	III.	Ec.	Re.
	20	27		I.	Sh.	In.	21	10	1		I.*	Tr.	In.	31	3	42		I.	Oc.	Dis.
	21	6		II.	Sh.	In.		10	23		II.*	Tr.	In.		7	15	51	I.*	Ec.	Re.
	21	26		II.	Tr.	Eg.		11	19		I.*	Sh.	In.		17	59		IV.	Oc.	Dis.
	21	28		I.	Tr.	Eg.		12	18		I.*	Tr.	Eg.		20	20		IV.	Oc.	Re.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

[Eph 07]

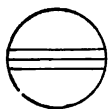


WASHINGTON MEAN TIME.

MARCH.

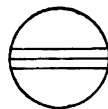
*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

I.



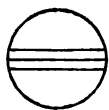
r  
\*

III.



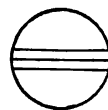
d  
\*      r  
\*

II.



r  
\*

IV.



d  
\*      r  
\*

*Configurations at 10<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.		East.	
1		'2 '3	○ '1	'4
2		'1	○ '2 '3	'4
3			○ '1 '3	4'
4		2' '1	○	3' 4'
5	○ 3'		'2 ○ '1	4'
6		3'	○ 4' 2'	'1 ●
7		'3 4' '1	○	
8		4' '2 '3	○ '1	
9		4' '1	○ '2 '3	
10	4'		○ '1 '3	
11	'4	2' '1	○	3'
12	'4		'2 ○ 3' '1	
13	'4 3'	'1	○	'2
14	○ '1 ○ 2'	'3 '4	○	
15		'2 '3	○ '1 '4	
16		'1	○ '2 '4	3' ●
17			○ '1 '3 '4	
18		2' '1	○	3' 4'
19		'2	○ '1 '3	4'
20		3' '1	○	'2 4'
21		3'	○ '1 '2	4'
22		'3 '2	○	4' '1 ●
23	○ 4'	'1	○ '3	'2 ●
24		4'	○ '1 2' '3	
25		4' '1	○	3'
26	4'	'2	○ '1 '3	
27	4'	3' '1	○	'2
28	'4	3'	○ '1 '2	
29	'4	'3 2'	○	'1 ●
30		'4 '1 '3	○	'2 ●
31		'4	○ '1 2' '3	

WASHINGTON MEAN TIME.

APRIL.

d	h	m	s	I.	Tr.	In.	d	h	m	s	III.*	Tr.	Eg.	d	h	m	s	I.	Sh.	Eg.
1	0	54		I.	Sh.	In.	10	7	53		III.*	Tr.	Eg.	20	15	46		I.	Sh.	Eg.
2	12			I.	Sh.	In.		9	47		III.*	Sh.	In.		20	43	18	II.	Ec.	Re.
3	22			II.	Tr.	In.		13	4		III.	Sh.	Eg.		22	56		III.	Oc.	Dis.
4	30			I.	Tr.	Eg.		18	38		I.	Oc.	Dis.	21	2	6		III.	Oc.	Re.
5	0			I.	Sh.	Eg.		22	9	18	I.	Ec.	Re.		3	45	44	III.	Ec.	Dis.
6	10	32		II.	Sh.	In.	11	15	49		I.	Tr.	In.		6	54	43	III.	Ec.	Re.
7	53			IV.	Ec.	Dis.		17	4		I.	Sh.	In.		9	36		I.*	Oc.	Dis.
8	9	2	3	II.*	Sh.	Eg.		18	7		I.	Tr.	Eg.		13	2	37	I.	Ec.	Re.
9	2	48		IV.*	Ec.	Re.		19	22		II.	Tr.	In.	22	6	46		I.	Tr.	In.
10	12			I.	Oc.	Dis.		20	57		I.	Sh.	Eg.		7	57		I.*	Sh.	In.
11	23			I.	Ec.	Re.		21	16		II.	Sh.	In.		9	4		I.*	Tr.	Eg.
12	40			I.	Tr.	In.		23	50		II.	Tr.	Eg.		10	15		I.*	Sh.	Eg.
13	53			I.	Sh.	In.	12	13	8	15	I.	Oc.	Dis.		10	30		II.*	Tr.	In.
14	0			II.	Oc.	Dis.		16	38		I.	Ec.	Re.		12	54		II.	Sh.	In.
15	11			I.	Tr.	Eg.	13	10	19		I.*	Tr.	In.		13	22		II.	Tr.	Eg.
16	21			I.	Sh.	Eg.		11	33		I.*	Sh.	In.	23	4	5		II.	Sh.	Eg.
17	39			III.	Tr.	In.		12	36		I.	Tr.	Eg.		7	31	31	I.	Oc.	Dis.
18	48			II.	Ec.	Re.		12	51		II.	Oc.	Dis.	24	1	16		I.*	Ec.	Re.
19	58			III.	Tr.	Eg.		13	51		I.	Sh.	Eg.		2	25		I.	Tr.	In.
20	0			III.	Sh.	In.		18	7	43	II.	Ec.	Re.		3	33		I.	Sh.	Eg.
21	10			III.*	Sh.	Eg.		18	44		III.	Oc.	Dis.		4	43		I.	Sh.	Eg.
22	20			I.	Oc.	Dis.		21	52		III.	Oc.	Re.		4	53		II.	Oc.	Dis.
23	30			I.	Ec.	Re.	14	2	53	33	III.	Ec.	Dis.		10	1	7	II.*	Ec.	Re.
24	40			I.	Tr.	In.		7	37	5	III.	Ec.	Re.		13	9		III.	Tr.	In.
25	50			I.	Sh.	In.	15	4	48		I.*	Oc.	Dis.		16	19		III.	Tr.	Eg.
26	0			II.	Tr.	In.		6	2		I.*	Ec.	Re.		17	47		III.	Sh.	In.
27	10			I.	Tr.	Eg.		7	6		I.	Tr.	In.	25	2	0	21	III.	Sh.	Eg.
28	20			I.	Sh.	Eg.		7	46		I.*	Tr.	Eg.		21	5		I.	Oc.	Dis.
29	30			II.	Sh.	In.		8	20		II.*	Tr.	In.		19	45		I.	Ec.	Re.
30	40			I.*	Oc.	Dis.		10	16		I.*	Sh.	Eg.		20	54		I.	Sh.	In.
31	50			I.	Ec.	Re.		10	38		II.*	Sh.	In.		22	3		I.	Tr.	Eg.
1	0			I.*	Tr.	In.		10	38		II.*	Tr.	Eg.		22	55		IV.	Tr.	In.
2	10			I.*	Oc.	Dis.		13	9		II.	Sh.	Eg.		23	12		I.	Sh.	Eg.
3	20			II.*	Tr.	Eg.	16	2	7		I.	Oc.	Dis.		23	53		II.	Tr.	In.
4	30			I.*	Sh.	In.		5	36	I	I.	Ec.	Re.	26	1	36		IV.	Tr.	Eg.
5	40			II.*	Oc.	Dis.		1	35		I.	Tr.	In.		2	12		II.	Sh.	In.
6	50			III.	Tr.	Eg.	17	0	30		I.	Sh.	In.		2	45		II.	Tr.	Eg.
7	0			III.	Oc.	Dis.		1	35		I.	Tr.	Eg.		5	5		II.	Sh.	Eg.
8	10			II.	Ec.	Re.		2	12		II.	Oc.	Dis.		9	22		IV.*	Sh.	In.
9	20			III.	Oc.	Re.		2	48		I.	Sh.	Eg.		12	35		IV.	Sh.	Eg.
10	30			III.	Ec.	Dis.		7	25	31	II.*	Ec.	Re.		17	5		I.	Oc.	Dis.
11	40			III.	Ec.	Re.		8	56		III.*	Tr.	In.		20	29	17	I.	Ec.	Re.
12	50			I.	Oc.	Dis.		12	5		III.	Tr.	Eg.	27	14	15		I.	Tr.	In.
13	0			I.*	Ec.	Re.		12	48		IV.	Oc.	Dis.		15	23		I.	Sh.	In.
14	10			I.	Tr.	In.		13	47		III.	Sh.	In.		16	33		I.	Tr.	Eg.
15	20			I.	Sh.	In.		15	21		IV.	Oc.	Re.		17	41		I.	Sh.	Eg.
16	30			II.	Tr.	In.		17	5		III.	Sh.	Eg.		18	15		II.	Oc.	Dis.
17	40			I.	Tr.	Eg.		20	36		I.	Oc.	Dis.		23	18	58	II.	Ec.	Re.
18	0	4	51	I.	Sh.	Eg.		0	4	51	I.	Ec.	Re.	28	3	12		III.	Oc.	Dis.
19	10	13	35	II.*	Sh.	In.		0	13	35	IV.	Ec.	Dis.		6	22	6	III.	Oc.	Re.
20	20	15	34	II.*	Tr.	Eg.		3	15	34	IV.	Ec.	Re.		7	46		III.*	Ec.	Dis.
21	30			II.*	Sh.	Eg.		17	47		I.	Tr.	In.		10	56	1	III.*	Ec.	Re.
22	40			I.	Oc.	Dis.		18	59		I.	Sh.	In.		11	35		I.	Oc.	Dis.
23	50			I.	Ec.	Re.		20	4		I.	Tr.	Eg.		14	58	4	I.	Ec.	Re.
24	0			IV.	Tr.	In.		21	8		II.	Tr.	In.	29	8	45		I.*	Tr.	In.
25	10			IV.	Tr.	Eg.		21	17		I.	Sh.	Eg.		9	52		I.*	Sh.	In.
26	20			IV.	Sh.	In.		23	34		II.	Sh.	In.		11	2		I.	Tr.	Eg.
27	30			IV.	Sh.	Eg.		23	59		II.	Tr.	Eg.		12	10		I.	Sh.	Eg.
28	40			I.	Tr.	In.	19	2	27		II.	Sh.	Eg.		13	16		II.	Tr.	In.
29	50			I.	Sh.	In.		15	6		I.	Oc.	Dis.		15	31		II.	Sh.	In.
30	0			II.	Oc.	Dis.		18	33	48	I.	Ec.	Re.		16	8		II.	Tr.	Eg.
31	10			I.	Tr.	Eg.	20	12	16		I.	Tr.	In.		18	25		II.	Sh.	Eg.
1	20			I.	Sh.	Eg.		13	28		I.	Sh.	In.	30	6	5		I.	Oc.	Dis.
2	30			III.	Tr.	In.		14	34		I.	Tr.	Eg.		9	26	58	I.*	Ec.	Re.
3	40			II.	Ec.	Re.		15	32		II.	Oc.	Dis.							

**NOTE.**—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

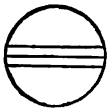
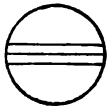
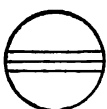
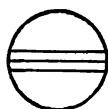
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

[Eph 07]

WASHINGTON MEAN TIME.

APRIL.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

I.		r *	III.		d *      r *
II.		r *	IV.		d *      r *

*Configurations at 9<sup>h</sup> 30<sup>m</sup> for an Inverting Telescope.*

Day.	West.			East.		
1		I' 2'	○	'4	3'	
2		'2	○	'1 3'	'4	
3		'1	○	'2		'4
4		3'	○	'1		'4
5		'3    2'	'1 ○			4'
6	○ I'		'3 '2 ○			4'
7			○ '1	'3	4'	
8		I' 2'	○	4'	'3	
9		'2    4'	○	'1 3'		
10		4'    '1 3'	○	'2		
11	4'    3'		○	I' 2'		
12	4'    '3    2'	'1 ○				
13	'4	'3 '2	○ I'			
14	'4		○	'3 '2		'1 ●
15	○ 2'	'4	I' ○		'3	
16		'4 '2	○	'1	3'	
17	○ 3'	I' '4	○	'2		
18		3'	○	I' '4		
19		'3    2' '1	○		'4	
20		'3 '2	○ I'		'4	
21			'1 ○	'3 '2		'4
22		I' ○ 2'		'3	4'	
23		'2	○	'1	3'    4'	
24		I'	○	3'	4'	'2 ●
25		3'	○	'1 2'		
26		3'    '1 4'	○			
27		4' '3 '2	○	I'		
28	4'		'1 ○	'2		'3 ●
29	○ I' 4'		○ 2'	'3		
30	'4	2'	○ '1	3'		

## WASHINGTON MEAN TIME.

MAY.

d	h	m	s				d	h	m	s				d	h	m	s			
1	3	14		I.	Tr.	In.	10	21	4		I.	Oc.	Dis.	21	0	31		II.	Tr.	Eg.
	4	20		I.	Sh.	In.	11	0	20	0	I.	Ec.	Re.		2	17		II.	Sh.	Eg.
	5	32		I.	Tr.	Eg.		18	14		I.	Tr.	In.		4	13		IV.	Oc.	Dis.
	6	38		I.	Sh.	Eg.		19	13		I.	Sh.	In.		7	13		IV.	Oc.	Re.
	7	36		II.*	Oc.	Dis.		20	32		I.	Tr.	Eg.		12	5		I.	Oc.	Dis.
	12	36	48	II.	Ec.	Re.		21	31		I.	Sh.	Eg.		12	20	7	IV.	Ec.	Dis.
	17	25		III.	Tr.	In.		23	43		II.	Oc.	Dis.		15	12	46	I.	Ec.	Re.
	20	36		III.	Tr.	Eg.	12	4	30	29	II.	Ec.	Re.		15	40	54	IV.	Ec.	Re.
	21	46		III.	Sh.	In.		11	48		III.	Oc.	Dis.	22	9	14		I.*	Tr.	In.
2	0	34		I.	Oc.	Dis.		15	1		III.	Oc.	Re.		10	5		I.	Sh.	In.
	1	6		III.	Sh.	Eg.		15	35		I.	Oc.	Dis.		11	32		I.	Tr.	Eg.
	3	55	46	I.	Ec.	Re.		15	45	25	III.	Ec.	Dis.		12	23		I.	Sh.	Eg.
	21	44		I.	Tr.	In.		18	34		IV.	Tr.	In.		15	53		II.	Oc.	Dis.
	22	49		I.	Sh.	In.		18	48	45	I.	Ec.	Re.		20	24	15	II.	Ec.	Re.
3	0	2		I.	Tr.	Eg.		18	57	9	III.	Ec.	Re.	23	6	27		III.	Tr.	In.
	1	7		I.	Sh.	Eg.		21	28		IV.	Tr.	Eg.		6	35		I.	Oc.	Dis.
	2	39		II.	Tr.	In.	13	3	23		IV.	Sh.	In.		9	41	30	I.	Ec.	Re.
	4	50		II.	Sh.	In.		6	45		IV.	Sh.	Eg.		9	42		III.	Tr.	Eg.
	5	31		II.	Tr.	Eg.		12	44		I.	Tr.	In.		9	46		III.	Sh.	In.
	7	43		II.*	Sh.	Eg.		13	41		I.	Sh.	In.		13	8		III.	Sh.	Eg.
	19	4		I.	Oc.	Dis.		15	2		I.	Tr.	Eg.	24	3	44		I.	Tr.	In.
	22	24	41	I.	Ec.	Re.		16	0		I.	Sh.	Eg.		4	33		I.	Sh.	In.
4	8	15		IV.*	Oc.	Dis.		18	50		II.	Tr.	In.		6	2		I.	Tr.	Eg.
	11	2		IV.	Oc.	Re.		20	46		II.	Sh.	In.		6	52		I.	Sh.	Eg.
	16	14		I.	Tr.	In.		21	43		II.	Tr.	Eg.		11	2		II.	Tr.	In.
	17	18		I.	Sh.	In.		23	40		II.	Sh.	Eg.		12	41		II.	Sh.	In.
	18	16	41	IV.	Ec.	Dis.	14	10	5		I.*	Oc.	Dis.		13	55		II.	Tr.	Eg.
	18	32		I.	Tr.	Eg.		13	17	36	I.	Ec.	Re.		15	35		II.	Sh.	Eg.
	19	36		I.	Sh.	Eg.	15	7	14		I.	Tr.	In.	25	1	5		I.	Oc.	Dis.
	20	58		II.	Oc.	Dis.		8	10		I.*	Sh.	In.		4	10	20	I.	Ec.	Re.
	21	28	25	IV.	Ec.	Re.		9	32		I.*	Tr.	Eg.		22	15		I.	Tr.	In.
5	1	54	41	II.	Ec.	Re.		10	28		I.	Sh.	Eg.		23	2		I.	Sh.	In.
	7	29		III.*	Oc.	Dis.		13	6		II.	Oc.	Dis.	26	0	33		I.	Tr.	Eg.
	10	41		III.	Oc.	Re.		17	48	22	II.	Ec.	Re.		1	21		I.	Sh.	Eg.
	11	45	51	III.	Ec.	Dis.	16	2	4		III.	Tr.	In.		5	16		II.	Oc.	Dis.
	13	34		I.	Oc.	Dis.		4	35		I.	Oc.	Dis.		9	42	19	II.	Ec.	Re.
	14	56	42	III.	Ec.	Re.		5	18		III.	Tr.	Eg.		19	36		I.	Oc.	Dis.
	16	53	27	I.	Ec.	Re.		5	46		III.	Sh.	In.		20	32		III.	Oc.	Dis.
6	10	44		I.	Tr.	In.		7	46	22	I.*	Ec.	Re.		22	39	3	I.	Ec.	Re.
	11	46		I.	Sh.	In.		9	7		III.*	Sh.	Eg.	27	2	58	10	III.	Ec.	Re.
	13	2		I.	Tr.	Eg.	17	1	44		I.	Tr.	In.		16	45		I.	Tr.	In.
	14	5		I.	Sh.	Eg.		2	39		I.	Sh.	In.		17	31		I.	Sh.	In.
	16	3		II.	Tr.	In.		4	2		I.	Tr.	Eg.		19	3		I.	Tr.	Eg.
	18	9		II.	Sh.	In.		4	57		I.	Sh.	Eg.		19	50		I.	Sh.	Eg.
	18	55		II.	Tr.	Eg.		8	14		II.*	Tr.	In.	28	0	27		II.	Tr.	In.
	21	2		II.	Sh.	Eg.		10	4		II.	Sh.	In.		2	0		II.	Sh.	In.
7	8	4		I.*	Oc.	Dis.		11	6		II.	Tr.	Eg.		3	20		II.	Tr.	Eg.
	11	22	19	I.	Ec.	Re.		12	58		II.	Sh.	Eg.		4	54		II.	Sh.	Eg.
8	5	14		I.	Tr.	In.		23	5		I.	Oc.	Dis.		14	6		I.	Oc.	Dis.
	6	15		I.	Sh.	In.	18	2	15	13	I.	Ec.	Re.		17	7	50	I.	Ec.	Re.
	7	32		I.*	Tr.	Eg.		20	14		I.	Tr.	In.	29	11	15		I.	Tr.	In.
	8	34		I.*	Sh.	Eg.		21	7		I.	Sh.	In.		12	0		I.	Sh.	Eg.
	10	21		II.*	Oc.	Dis.		22	32		I.	Tr.	Eg.		13	33		I.	Sh.	Eg.
	15	12	33	II.	Ec.	Re.		23	26		I.	Sh.	Eg.		14	38		I.	Sh.	Eg.
	21	44		III.	Tr.	In.	19	2	30		II.	Oc.	Dis.		17	44		IV.	Tr.	Eg.
9	0	56		III.	Tr.	Eg.		7	6	22	II.	Ec.	Re.		18	40		II.	Oc.	Dis.
	1	46		III.	Sh.	In.		16	9		III.	Oc.	Dis.		21	23		IV.	Sh.	In.
	2	34		I.	Oc.	Dis.		17	35		I.	Oc.	Dis.	30	0	54		IV.	Sh.	Eg.
	5	7		III.	Sh.	Eg.		19	24		III.	Oc.	Re.		8	36		I.*	Oc.	Dis.
	5	51	7	I.	Ec.	Re.		19	45	3	III.	Ec.	Dis.		10	50		III.	Tr.	In.
	23	44		I.	Tr.	In.		20	43	57	I.	Ec.	Re.		11	36	33	I.	Ec.	Re.
10	0	44		I.	Sh.	In.		22	57	40	III.	Ec.	Re.		13	46		III.	Sh.	In.
	2	2		I.	Tr.	Eg.	20	14	44		I.	Tr.	In.	31	5	45		III.	Tr.	Eg.
	3	2		I.	Sh.	Eg.		15	36		I.	Sh.	In.		6	28		I.	Sh.	In.
	5	26		II.	Tr.	In.		17	2		I.	Tr.	Eg.		8	3		I.*	Tr.	Eg.
	7	27		II.*	Sh.	In.		17	55		I.	Sh.	Eg.		8	47		I.*	Sh.	Eg.
	8	18		II.*	Tr.	Eg.		21	38		II.	Tr.	In.		13	51		II.	Tr.	In.
	10	20		II.	Sh.	Eg.		23	23		II.	Sh.	In.		15	18		II.	Sh.	In.
															16	44		II.	Tr.	Eg.
															18	12		II.	Sh.	Eg.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

[Eph 07]

WASHINGTON MEAN TIME.

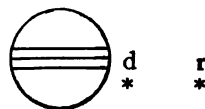
MAY.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

I.



III.



II.



IV.



*Configurations at 9<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.			
1	'4		I'	○	3'		'2●	
2	'4		3'	○	'I	2'		
3		3'	'4	I' 2'	○			'
4		'3	'2	○	I'		'4●	
5			'I	○	'2	'4		'3●
6				○	I' 2'	'3	'4	
7		2'		○		3'	'4	'I●
8			'2	○	3'		'4	
9			3'	○	'I	'2		4'
10		3'	I' 2'	○			4'	
11		'3	'2	○	I'	4'		
12			'I	'3	○	'4		
13			4'	○	I' 2'	'3		
14		4'	2'	'I	○		'3	
15	○ I'	4'		'2	○	3'		
16	4'			3'	○	'I	'2	
17	○ 2' '4		3'	I'	○			
18	'4	'3	'2	○	'I			
19	'4		'I '2	○	'3			
20		'4		○	I' '3			
21		2'	'I	○	'4		'3	
22		'2		○	I' '3	'4		
23	○ 3'			○	'2		'4	'I●
24		3'	I'	○	2'		'4	
25		'3	2'	○	'I		'4	
26			'3	○			4'	'2●
27				○	'3	2'	4'	
28			'2	○		4'	'3	
29			'2	○	'1	3'		
30			4'	○	3'	'2		'I●
31	4'	3'	I'	○	2'			

## WASHINGTON MEAN TIME.

## JUNE.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	3	6		I. Oc. Dis.	7	0	31		IV. Oc. Dis.	11	20	57	38		I. Ec. Re.				
	6	5	21	I. Ec. Re.		3	45		IV. Oc. Re.	12	15	17			I. Tr. In.				
2	0	15		I. Tr. In.		6	22	40	IV. Ec. Dis.		15	49			I. Sh. In.				
	0	57		I. Sh. In.		7	46		I. Tr. In.		17	35			I. Tr. Eg.				
	2	34		I. Tr. Eg.		8	23		I.* Sh. In.		18	8			I. Sh. Eg.				
	3	16		I. Sh. Eg.		9	51	50	IV. Ec. Re.	13	0	17			II. Oc. Dis.				
	8	4		II.* Oc. Dis.		10	4		I. Tr. Eg.		4	12	22		II. Ec. Re.				
	12	18	21	II. Ec. Re.		10	42		I. Sh. Eg.		12	39			I. Oc. Dis.				
	21	37		I. Oc. Dis.		16	40		II. Tr. In.		15	26	18		I. Ec. Re.				
3	0	34	2	I. Ec. Re.		17	54		II. Sh. In.		19	40			III. Tr. In.				
	0	57		III. Oc. Dis.		19	34		II. Tr. Eg.		21	44			III. Sh. In.				
	6	59	12	III. Ec. Re.		20	48		II. Sh. Eg.		23	0			III. Tr. Eg.				
	18	46		I. Tr. In.		8	5	8	I. Oc. Dis.	14	1	8			III. Sh. Eg.				
	19	26		I. Sh. In.		8	0	15	I.* Ec. Re.		9	47			I. Tr. In.				
	21	4		I. Tr. Eg.		9	2	16	I. Tr. In.		10	18			I. Sh. In.				
	21	45		I. Sh. Eg.		2	52		I. Sh. In.		12	6			I. Tr. Eg.				
4	3	16		II. Tr. In.		4	35		I. Tr. Eg.		12	37			I. Sh. Eg.				
	4	36		II. Sh. In.		5	11		I. Sh. Eg.		19	30			II. Tr. In.				
	6	9		II. Tr. Eg.		10	53		II. Oc. Dis.		20	31			II. Sh. In.				
	7	30		II. Sh. Eg.		14	54	27	II. Ec. Re.		22	24			II. Tr. Eg.				
	16	7		I. Oc. Dis.		23	38		I. Oc. Dis.		23	25			II. Sh. Eg.				
	19	2	47	I. Ec. Re.	10	2	28	55	I. Ec. Re.	15	7	9			I. Oc. Dis.				
5	13	16		I. Tr. In.		5	23		III. Oc. Dis.		9	55	2		I. Ec. Re.				
	13	54		I. Sh. In.		10	59	37	III. Ec. Re.		10	55			IV. Tr. In.				
	15	34		I. Tr. Eg.		20	47		I. Tr. In.		14	17			IV. Tr. Eg.				
	16	13		I. Sh. Eg.		21	20		I. Sh. In.		15	23			IV. Sh. In.				
	21	28		II. Oc. Dis.		23	5		I. Tr. Eg.		19	2			IV. Sh. Eg.				
6	1	36	15	II. Ec. Re.		23	39		I. Sh. Eg.	16	4	18			I. Tr. In.				
	10	37		I. Oc. Dis.	11	6	5		II. Tr. In.		4	46			I. Sh. In.				
	13	31	29	I. Ec. Re.		7	13		II. Sh. In.		6	36			I. Tr. Eg.				
	15	14		III. Tr. In.		8	59		II. Tr. Eg.		7	5			I. Sh. Eg.				
	17	44		III. Sh. In.		10	7		II. Sh. Eg.		13	42			II. Oc. Dis.				
	18	32		III. Tr. Eg.		18	8		I. Oc. Dis.		17	30	38		II. Ec. Re.				
	21	8		III. Sh. Eg.															

By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from June 17 to August 15.

NOTE.—In., denotes ingress, Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

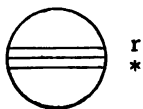
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

## WASHINGTON MEAN TIME.

JUNE.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

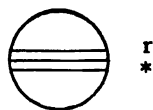
I.



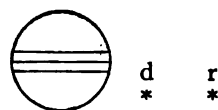
III.



II.



IV.

*Configurations at 8<sup>h</sup> 30<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.			
1		4'	'3	2'	○	'1		
2	4'			'3 1'	○			'2 ●
3	'4				○	'3 '1 2'		
4		'4		'1 2'	○		'3	
5			'4	'2	○	1'	3'	
6				'4 '1	○	3' '2		
7	○ 1'			3'	○	2'		'4 ●
8			3'	2'	○	'1	'4	
9				'3 1' '2	○		'4	
10					○	'1 '2		'4 '3 ●
11	○ 2'			1'	○	'3		4'
12				'2	○	1'	3'	4'
13				'1	○	'2 3'		4'
14				3'	○	1' 2' 4'		
15			3'	2'	○	4'		'1 ●
16			'3	4' '2 1'	○			
17					○			
18					○			
19					○			
20					○			
21					○			
22					○			
23					○			
24					○			
25					○			
26					○			
27					○			
28					○			
29					○			
30					○			
31					○			

## WASHINGTON MEAN TIME.

AUGUST.

By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from June 17 to August 15.

d	h	m	s				d	h	m	s				d	h	m	s			
16	0	48	27	II.	Ec.	Dis.	21	13	9		II.	Tr.	Eg.	26	21	0		II.	Oc.	Re.
	4	45		II.	Oc.	Re.		13	45	18	I.	Ec.	Dis.		21	10	30	I.	Ec.	Dis.
	6	20	I	I.	Ec.	Dis.		15	19		IV.	Sh.	In.	27	0	8		I.	Oc.	Re.
	9	8		I.	Oc.	Re.		16	38		I.*	Oc.	Re.		18	19		I.	Sh.	In.
17	3	27		I.	Sh.	In.		19	25		IV.	Sh.	Eg.		19	0		I.	Tr.	In.
	3	59		I.	Tr.	In.		20	53		IV.	Tr.	In.		20	38		I.	Sh.	Eg.
	5	47		I.	Sh.	Eg.	22	1	6		IV.	Tr.	Eg.		21	20		I.	Tr.	Eg.
	6	19		I.	Tr.	Eg.		10	53		I.	Sh.	In.	28	3	31	22	III.	Ec.	Dis.
	9	35		III.	Sh.	In.		11	30		I.	Tr.	In.		9	50		III.	Oc.	Re.
	11	45		III.	Tr.	In.		13	12		I.	Sh.	Eg.		11	38		II.	Sh.	In.
	13	6		III.	Sh.	Eg.		13	49		I.	Tr.	Eg.		13	1		II.	Tr.	In.
	15	18		III.	Tr.	Eg.	23	3	24	52	II.	Ec.	Dis.		14	33		II.	Sh.	Eg.
	19	47		II.	Sh.	In.		7	35		II.	Oc.	Re.		15	38	52	I.*	Ec.	Dis.
	20	52		II.	Tr.	In.		8	13	41	I.	Ec.	Dis.		15	57		II.*	Tr.	Eg.
	22	43		II.	Sh.	Eg.		11	8		I.	Oc.	Re.		18	38		I.	Oc.	Re.
	23	47		II.	Tr.	Eg.	24	5	22		I.	Sh.	In.	29	12	47		I.	Sh.	In.
18	0	48	29	I.	Ec.	Dis.		6	0		I.	Tr.	In.		13	30		I.	Tr.	In.
	3	38		I.	Oc.	Re.		7	41		I.	Sh.	Eg.		15	7		I.	Sh.	Eg.
	21	56		I.	Sh.	In.		8	19		I.	Tr.	Eg.		15	50		I.*	Tr.	Eg.
	22	30		I.	Tr.	In.		13	34		III.	Sh.	In.	30	0	30	47	IV.	Ec.	Dis.
	19	0	15	I.	Sh.	Eg.		16	10		III.*	Tr.	In.		4	33	59	IV.	Ec.	Re.
	0	49		I.	Tr.	Eg.		17	6		III.	Sh.	Eg.		6	1	17	II.	Ec.	Dis.
	14	7	8	II.	Ec.	Dis.		19	44		III.	Tr.	Eg.		7	23		IV.	Oc.	Dis.
	18	11		II.	Oc.	Re.		22	21		II.	Sh.	In.		10	7	14	I.	Ec.	Dis.
	19	16	53	I.	Ec.	Dis.		23	38		II.	Tr.	In.		10	24		II.	Oc.	Re.
	22	8		I.	Oc.	Re.	25	1	16		II.	Sh.	Eg.		11	41		IV.	Oc.	Re.
20	16	25		I.*	Sh.	In.		2	34		II.	Tr.	Eg.		13	8		I.	Oc.	Re.
	17	0		I.	Tr.	In.		2	42	6	I.	Ec.	Dis.	31	7	16		I.	Sh.	In.
	18	44		I.	Sh.	Eg.		5	38		I.	Oc.	Re.		8	0		I.	Tr.	In.
	19	19		I.	Tr.	Eg.		23	50		I.	Sh.	In.		9	35		I.	Sh.	Eg.
	23	33	11	III.	Ec.	Dis.	26	0	30		I.	Tr.	In.		10	20		I.	Tr.	Eg.
21	5	25		III.	Oc.	Re.		2	10		I.	Sh.	Eg.		17	33		III.	Sh.	In.
	9	4		II.	Sh.	In.		2	50		I.	Tr.	Eg.		20	34		III.	Tr.	In.
	10	15		II.	Tr.	In.		16	43	34	II.*	Ec.	Dis.		21	5		III.	Sh.	Eg.
	11	59		II.	Sh.	Eg.														

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

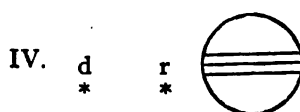
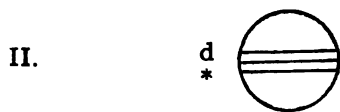
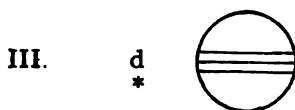
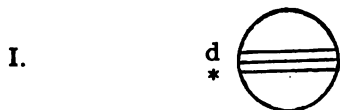
[Eph 07]



WASHINGTON MEAN TIME.

AUGUST.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*



*Configurations at 16<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.		East.	
1			○	
2			○	
3			○	
4			○	
5			○	
6			○	
7			○	
8			○	
9			○	
10			○	
11			○	
12			○	
13			○	
14			○	
15			○	
16			○	'1 '2 3' '4
17		'1 3' ○ 2'		'4
18	3' 2'	○ 1'		4'
19	'3 '1	○	4'	'2 ●
20	'3	○ 1' 2' 4'		
21	2'	○ 4' '3		'1 ●
22	'2 1'	○	'3	
23	4'	○ '1 '2 3'		
24	4' 1' ○ 3' 2'			
25	4' 3' 2'	○ 1'		
26	'4 '3 '1 '2	○		
27	'4 '3	○ 1' '2		
28	'4 2' ○ '3		'1 ●	
29	'2 '4 1' ○ '3			
30		○ '1 '2 3'		
31	1' ○ 3' 2' '4			

## WASHINGTON MEAN TIME.

## SEPTEMBER.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	0	9		III. Tr. Eg.	11	14	52	33	III.* Ec. Re.	21	13	58		I. Tr. In.					
	0	55		II. Sh. In.		14	59		III.* Oc. Dis.		15	17		I.* Sh. Eg.					
	2	24		II. Tr. In.		16	45		II.* Sh. In.		16	18		I.* Tr. Eg.					
	3	50		II. Sh. Eg.		18	31		II. Tr. In.	22	5	27		III. Sh. In.					
	4	35	38	I. Ec. Dis.		18	36		III. Oc. Re.		8	35		II. Sh. In.					
	5	20		II. Tr. Eg.		19	25	45	I. Ec. Dis.		9	1		III. Sh. Eg.					
	7	38		I. Oc. Re.		19	41		II. Sh. Eg.		9	34		III. Tr. In.					
2	1	44		I. Sh. In.		21	27		II. Tr. Eg.		10	15	42	I. Ec. Dis.					
	2	30		I. Tr. In.		22	37		I. Oc. Re.		10	36		II. Tr. In.					
	4	4		I. Sh. Eg.	12	16	35		I.* Sh. In.		11	31		II. Sh. Eg.					
	4	50		I. Tr. Eg.		17	29		I. Tr. In.		13	12		III. Tr. Eg.					
	19	20	0	II. Ec. Dis.		18	55		I. Sh. Eg.		13	32		II. Tr. Eg.					
	23	4	0	I. Ec. Dis.		19	49		I. Tr. Eg.		13	34		I. Oc. Re.					
	23	49		II. Oc. Re.	13	11	14	8	II. Ec. Dis.	23	7	26		I. Sh. In.					
3	2	8		I. Oc. Re.		13	54	4	I. Ec. Dis.		8	28		I. Tr. In.					
	20	13		I. Sh. In.		16	1		II.* Oc. Re.		9	46		I. Sh. Eg.					
	21	0		I. Tr. In.		17	6		I.* Oc. Re.		10	48		I. Tr. Eg.					
	22	32		I. Sh. Eg.	14	11	4		I. Sh. In.	24	3	9	18	II. Ec. Dis.					
	23	20		I. Tr. Eg.		11	59		I. Tr. In.		3	14		IV. Sh. In.					
4	7	29	32	III. Ec. Dis.		13	23		I. Sh. Eg.		4	44	1	I. Ec. Dis.					
	14	11		II. Sh. In.		14	19		I.* Tr. Eg.		7	32		IV. Sh. Eg.					
	14	13		III. Oc. Re.	15	1	29		III. Sh. In.		8	4		I. Oc. Re.					
	15	46		II.* Tr. In.		5	2		III. Sh. Eg.		8	11		II. Oc. Re.					
	17	7		II.* Sh. Eg.		5	15		III. Tr. In.		12	52		IV. Tr. In.					
	17	32	22	I. Ec. Dis.		6	2		II. Sh. In.		17	23		IV.* Tr. Eg.					
	18	42		II. Tr. Eg.		7	53		II. Tr. In.	25	1	54		I. Sh. In.					
	20	38		I. Oc. Re.		8	22	25	I. Ec. Dis.		2	57		I. Tr. In.					
5	14	41		I. Sh. In.		8	53		III. Tr. Eg.		4	14		I. Sh. Eg.					
	15	30		I.* Tr. In.		8	58		II. Sh. Eg.		5	17		I. Tr. Eg.					
	17	1		I.* Sh. Eg.		10	49		II. Tr. Eg.		19	24	33	III. Ec. Dis.					
	17	50		I. Tr. Eg.		11	36		I. Oc. Re.		21	52		II. Sh. In.					
6	8	37	42	II. Ec. Dis.		18	30	55	IV. Ec. Dis.		22	50	0	III. Ec. Re.					
	12	0	42	I. Ec. Dis.		22	39	34	IV. Ec. Re.		23	12	18	I. Ec. Dis.					
	13	13		II. Oc. Re.	16	3	29		IV. Oc. Dis.		23	35		III. Oc. Dis.					
	15	8		I.* Oc. Re.		5	32		I. Sh. In.		23	57		II. Tr. In.					
7	9	10		I. Sh. In.		6	29		I. Tr. In.	26	0	48		II. Sh. Eg.					
	9	17		IV. Sh. In.		7	52		I. Sh. Eg.		2	33		I. Oc. Re.					
	10	0		I. Tr. In.		7	56		IV. Oc. Re.		2	53		II. Tr. Eg.					
	11	29		I. Sh. Eg.		8	49		I. Tr. Eg.		3	14		III. Oc. Re.					
	12	20		I. Tr. Eg.	17	0	32	53	II. Ec. Dis.		20	23		I. Sh. In.					
	13	28		IV. Sh. Eg.		2	50	45	I. Ec. Dis.		21	27		I. Tr. In.					
	17	4		IV.* Tr. In.		5	25		II. Oc. Re.		22	42		I. Sh. Eg.					
	21	26		IV. Tr. Eg.		6	6		I. Oc. Re.		23	47		I. Tr. Eg.					
	21	31		III. Sh. In.	18	0	1		I. Sh. In.	27	16	26	57	II.* Ec. Dis.					
8	0	55		III. Tr. In.		0	59		I. Tr. In.		17	40	36	I. Ec. Dis.					
	1	4		III. Sh. Eg.		2	20		I. Sh. Eg.		21	3		I. Oc. Re.					
	3	28		II. Sh. In.		3	18		I. Tr. Eg.		21	34		II. Oc. Re.					
	4	31		III. Tr. Eg.		15	26	21	III.* Ec. Dis.	28	14	51		I.* Sh. In.					
	5	9		II. Tr. In.		18	51	14	III. Ec. Re.		15	56		I.* Tr. In.					
	6	24		II. Sh. Eg.		19	18		II. Sh. In.		17	11		I.* Sh. Eg.					
	6	29	5	I. Ec. Dis.		19	18		III. Oc. Dis.		18	16		I. Tr. Eg.					
	8	5		II. Tr. Eg.		21	14		II. Tr. In.	29	9	26		III. Sh. In.					
	9	37		I. Oc. Re.		21	19	4	I. Ec. Dis.		11	8		I. Sh. In.					
9	3	38		I. Sh. In.		22	14		II. Sh. Eg.		12	8	54	I. Ec. Dis.					
	4	30		I. Tr. In.		22	56		III. Oc. Re.		13	0		III. Sh. Eg.					
	5	58		I. Sh. Eg.	19	0	11		II. Tr. Eg.		13	18		II. Tr. In.					
	6	50		I. Tr. Eg.		0	35		I. Oc. Re.		13	50		III.* Tr. In.					
	21	56	27	II. Ec. Dis.		18	29		I. Sh. In.		14	4		II.* Sh. Eg.					
10	0	57	25	I. Ec. Dis.		19	28		I. Tr. In.		15	32		I.* Oc. Re.					
	2	38		II. Oc. Re.		20	48		I. Sh. Eg.		16	14		II.* Tr. Eg.					
	4	7		I. Oc. Re.		21	48		I. Tr. Eg.		17	28		III.* Tr. Eg.					
	22	7		I. Sh. In.	20	13	50	33	II. Ec. Dis.	30	9	20		I. Sh. In.					
	23	0		I. Tr. In.		15	47	22	I.* Ec. Dis.		10	26		I. Tr. In.					
11	0	26		I. Sh. Eg.		18	48		II. Oc. Re.		11	39		I. Sh. Eg.					
	1	20		I. Tr. Eg.		19	5		I. Oc. Re.		12	46		I. Tr. Eg.					
	11	28	15	III. Ec. Dis.	21	12	58		I. Sh. In.										

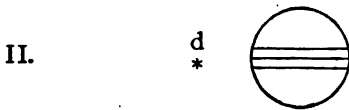
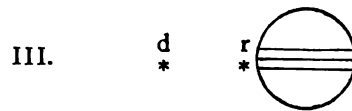
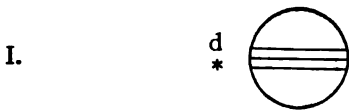
NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

WASHINGTON MEAN TIME.

SEPTEMBER.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*



*Configurations at 16<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.		East.	
1		3' 2"	○	'1                      '4
2		3'                      '1 '2	○	'4
3		'3	○	1'                      '2                      4'
4	○ 2'		'1	○ '3                      4'
5	○ 1'		'2	○                      '3                      4'
6				○ '1 '2                      4' 3'
7			1'	○ 4'                      3' 2'
8		4' 3' 2"	○	'1
9		4' 3'                      1''2	○	
10	4'	'3	○	1'                      '2
11	4'		'1	○ 2'                      "                      '3 ●
12	'4	2'	○	1'                      '3
13	'4			○                      3'                      '2 ● '1 ●
14		'4                      1'	○	3' 2'
15		3' 2' 4'	○	'1
16	3'	1' 2'	○	'4
17	'3		○	1' '2                      '4
18		'1	○	2'                      '4                      '3 ●
19		2'	○	1'                      '3                      '4
20			○	'3                      4' '1 ●
21	○ 1'			○                      3' 2'                      4'
22		3' 2'	○	'1                      4'
23		3'                      '2                      1'	○	4'
24	○ 4'	'3	○	'1 2'
25		4'                      '1 '3	○	2'
26	4'	2'	○	1'                      '3
27	4'		'1 2'	○                      '3
28	○ 1' 4'			○                      '2 3'
29	○ 3' 2' '4			○ '1
30	'4	3' '2                      1'	○	

## WASHINGTON MEAN TIME.

## OCTOBER.

d	h	m	s				d	h	m	s				d	h	m	s			
1	5	45	42	II.	Ec.	Dis.	11	1	22		I.	Tr.	In.	21	0	12		II.	Tr.	Eg.
	6	37	12	I.	Ec.	Dis.		1	34		IV.	Sh.	Eg.		0	57		III.	Sh.	Eg.
10	1			I.	Oc.	Re.		2	30		I.	Sh.	Eg.		2	22		III.	Tr.	In.
10	57			II.	Oc.	Re.		3	42		I.	Tr.	Eg.		6	2		III.	Tr.	Eg.
2	3	48		I.	Sh.	In.		8	11		IV.	Tr.	In.		15	1		I.*	Sh.	In.
	4	55		I.	Tr.	In.		12	49		IV.	Tr.	Eg.		16	16		I.*	Tr.	In.
	6	8		I.	Sh.	Eg.		21	26	52	I.	Ec.	Dis.		17	21		I.*	Sh.	Eg.
	7	15		I.	Tr.	Eg.		21	39	38	II.	Ec.	Dis.		18	36		I.	Tr.	Eg.
12	30	41		IV.	Ec.	Dis.	12	0	56		I.	Oc.	Re.	22	12	16	30	I.	Ec.	Dis.
16	44	23		IV.*	Ec.	Re.		3	1		II.	Oc.	Re.		13	34	34	II.*	Ec.	Dis.
23	9			IV.	Oc.	Dis.		18	39		I.	Sh.	In.		15	49		I.*	Oc.	Re.
23	22	10		III.	Ec.	Dis.		19	51		I.	Tr.	In.		19	3		II.	Oc.	Re.
3	0	25		II.	Sh.	In.		20	59		I.	Sh.	Eg.	23	9	30		I.	Sh.	In.
	1	5	29	I.	Ec.	Dis.		22	11		I.	Tr.	Eg.		10	45		I.	Tr.	In.
	2	38		II.	Tr.	In.	13	15	55	9	I.*	Ec.	Dis.		11	49		I.	Sh.	Eg.
	2	48	10	III.	Ec.	Re.		16	15		II.*	Sh.	In.		13	5		I.*	Tr.	Eg.
	3	21		II.	Sh.	Eg.		17	23		III.*	Sh.	In.	24	6	44	44	I.	Ec.	Dis.
	3	44		IV.	Oc.	Re.		18	38		II.	Tr.	In.		8	5		II.	Sh.	In.
	3	50		III.	Oc.	Dis.		19	11		II.	Sh.	Eg.		10	18		I.	Oc.	Re.
	4	30		I.	Oc.	Re.		19	25		I.	Oc.	Re.		10	34		II.	Tr.	In.
	5	35		II.	Tr.	Eg.		20	58		III.	Sh.	Eg.		11	1		II.	Sh.	Eg.
	7	29		III.	Oc.	Re.		21	34		II.	Tr.	Eg.		11	15	8	III.	Ec.	Dis.
	22	17		I.	Sh.	In.		22	14		III.	Tr.	In.		13	30		II.*	Tr.	Eg.
23	25			I.	Tr.	In.	14	1	54		III.	Tr.	Eg.		14	42	40	III.*	Ec.	Re.
4	0	36		I.	Sh.	Eg.		13	7		I.*	Sh.	In.		16	15		III.*	Oc.	Dis.
	1	45		I.	Tr.	Eg.		14	20		I.*	Tr.	In.		19	56		III.*	Oc.	Re.
19	3	19		II.	Ec.	Dis.		15	27		I.*	Sh.	Eg.	25	3	58		I.	Sh.	In.
19	33	45		I.	Ec.	Dis.		16	40		I.*	Tr.	Eg.		5	14		I.	Tr.	In.
23	0			I.	Oc.	Re.	15	10	23	26	I.	Ec.	Dis.		6	18		I.	Sh.	Eg.
5	0	18		II.	Oc.	Re.		10	58	20	II.	Ec.	Dis.		7	34		I.	Tr.	Eg.
16	45			I.*	Sh.	In.		13	54		I.*	Oc.	Re.	26	1	12	59	I.	Ec.	Dis.
17	54			I.	Tr.	In.		16	23		II.*	Oc.	Re.		2	52	8	II.	Ec.	Dis.
19	5			I.	Sh.	Eg.	16	7	36		I.	Sh.	In.		4	46		I.	Oc.	Re.
20	14			I.	Tr.	Eg.		8	49		I.	Tr.	In.		8	22		II.	Oc.	Re.
6	13	24		III.*	Sh.	In.		9	56		I.	Sh.	Eg.		22	26		I.	Sh.	In.
13	42			II.*	Sh.	In.		11	9		I.	Tr.	Eg.		23	42		I.	Tr.	In.
14	2	3		I.*	Ec.	Dis.	17	4	51	41	I.	Ec.	Dis.	27	0	46		I.	Sh.	Eg.
15	58			II.*	Tr.	In.		5	32		II.	Sh.	In.		2	2		I.	Tr.	Eg.
16	38			II.	Sh.	Eg.		7	17	23	III.	Ec.	Dis.		15	8		IV.*	Sh.	In.
17	0			III.*	Sh.	Eg.		7	57		II.	Tr.	In.		19	35		IV.	Sh.	Eg.
17	29			I.*	Oc.	Re.		8	23		I.	Oc.	Re.		19	41	15	I.	Ec.	Dis.
18	4			III.	Tr.	In.		8	28		II.	Sh.	Eg.		21	21		II.	Sh.	In.
18	55			II.	Tr.	Eg.		10	44	25	III.	Ec.	Re.		23	15		I.	Oc.	Re.
21	43			III.	Tr.	Eg.		10	53		II.	Tr.	Eg.		23	52		II.	Tr.	In.
7	11	14		I.	Sh.	In.		12	10		III.	Oc.	Dis.	28	0	17		II.	Sh.	Eg.
12	23			I.	Tr.	In.		15	50		III.*	Oc.	Re.		1	19		III.	Sh.	In.
13	33			I.*	Sh.	Eg.	18	2	4		I.	Sh.	In.		2	48		II.	Tr.	Eg.
14	43			I.*	Tr.	Eg.		3	18		I.	Tr.	In.		2	52		IV.	Tr.	In.
8	8	22	2	II.	Ec.	Dis.		4	24		I.	Sh.	Eg.		4	56		III.	Sh.	Eg.
8	30	20		I.	Ec.	Dis.		5	38		I.	Tr.	Eg.		6	26		III.	Tr.	In.
11	58			I.	Oc.	Re.		23	19	57	I.	Ec.	Dis.		7	35		IV.	Tr.	Eg.
13	40			II.*	Oc.	Re.	19	0	15	55	II.	Ec.	Dis.		10	7		III.	Tr.	Eg.
9	5	42		I.	Sh.	In.		2	52		I.	Oc.	Re.		16	55		I.*	Sh.	In.
6	53			I.	Tr.	In.		5	43		II.	Oc.	Re.		18	11		I.	Tr.	In.
8	2			I.	Sh.	Eg.		6	30	37	IV.	Ec.	Dis.		19	15		I.	Sh.	Eg.
9	13			I.	Tr.	Eg.		10	49	0	IV.	Ec.	Re.	29	14	9	32	I.	Tr.	Eg.
10	2	58		II.	Sh.	In.		18	14		IV.	Oc.	Dis.		16	10	45	I.*	Ec.	Dis.
2	58	36		I.	Ec.	Dis.		20	33		I.	Sh.	In.		17	43		I.*	Oc.	Re.
3	19	40		III.	Ec.	Dis.		21	47		I.	Tr.	In.	30	11	33		II.	Oc.	Re.
5	18			II.	Tr.	In.		22	53		I.	Sh.	Eg.		12	40		I.	Sh.	In.
5	54			II.	Sh.	Eg.		22	55		IV.	Oc.	Re.		13	43		I.*	Sh.	Eg.
6	27			I.	Oc.	Re.	20	0	7		I.	Tr.	Eg.	31	15	0		I.*	Tr.	Eg.
6	46	12		III.	Ec.	Re.		17	48	13	I.*	Ec.	Dis.		8	37	46	I.	Ec.	Dis.
8	1			III.	Oc.	Dis.		18	48		II.	Sh.	In.		12	12		II.	Sh.	In.
8	15			II.	Tr.	Eg.		21	15		II.	Tr.	In.		13	9		I.*	Oc.	Re.
11	41			III.	Oc.	Re.		21	20		I.	Oc.	Re.		13	34		II.*	Sh.	Eg.
21	11			IV.	Sh.	In.		21	21		III.	Sh.	In.		15	13	29	III.*	Ec.	Dis.
11	0	11		I.	Sh.	In.		21	21		II.	Sh.	Eg.		16	5		II.*	Tr.	Eg.
															18	41	30	III.	Ec.	Re.
															20	17		III.	Oc.	Dis.
															23	58		III.	Oc.	Re.

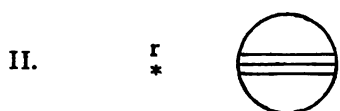
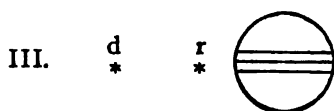
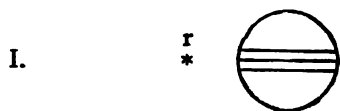
NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

[Eph 07]

## WASHINGTON MEAN TIME.

OCTOBER.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.**Configurations at 15<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.		East.	
1	'3 '4	○	'2 'I	
2	'3 'I'	○	2'	'4 ●
3	2'	○	'1 3,4	
4	'1 3	○	'3 4	
5		○	'I' '2 3' '4	
6		○	'3 2	'4 'I ●
7	3''2	'I' ○		4'
8	'3	○	'2 'I	4'
9	'3 'I'	○	2' 4'	
10	2'	○	'3 'I 4'	
11	'1 4	○	'3	
12	4'	○	'I' '2 3'	
13	4'	'I' ○	'3 2	
14	○ 'I' 4' 2' 3'	○		
15	4' 3'	○	'I	'2 ●
16	'4 '3 'I'	○	2'	
17	'4 2'	○	'I	'3 ●
18	'4 '21'	○	'3	
19	'4	○	'I' '2 3'	
20	'I	○	2' 3' 4'	
21	2' 3'	○	'I' 4'	
22	3'	○		'4 'I ● '2 ●
23	'3 'I'	○	2'	'4
24	'3 2	○	'I	4'
25	'2 'I'	○	'3 4'	
26		○	'1 2 '3 3	
27	'I	○	'4 3 3'	
28	2' 4' 3	○	'I'	
29	'4 3	○		'I ●
30	4' '3 'I'	○	'2	
31	○ 2' 4' '3	○	'I	

## WASHINGTON MEAN TIME.

## NOVEMBER.

d	h	m	s				d	h	m	s				d	h	m	s			
1	5	52		I.	Sh.	In.	11	12	52		III.*	Sh.	Eg.	21	20	43		II.	Tr.	In.
7	8			I.	Tr.	In.	14	21			III.*	Tr.	In.	21	14			II.	Sh.	Eg.
8	12			I.	Sh.	Eg.	18	3			III.*	Tr.	Eg.	22	55	53		IV.	Ec.	Re.
9	28			I.	Tr.	Eg.	20	42			I.	Sh.	In.	23	40			II.	Tr.	Eg.
2	3	6	2	I.	Ec.	Dis.	21	58			I.	Tr.	In.	23	3	6	43	III.	Ec.	Dis.
5	28	16		II.	Ec.	Dis.	23	2			I.	Sh.	Eg.	6	2			IV.	Oc.	Dis.
6	40			I.	Oc.	Re.	12	0	18		I.	Tr.	Eg.	6	36	4		III.	Ec.	Re.
10	59			II.	Oc.	Re.	17	55	36		I.*	Ec.	Dis.	7	57			III.	Oc.	Dis.
3	0	20		I.	Sh.	In.	21	22	52		II.	Ec.	Dis.	10	50			IV.*	Oc.	Re.
1	37			I.	Tr.	In.	21	29			I.	Oc.	Re.	11	33			I.*	Sh.	In.
2	40			I.	Sh.	Eg.	13	2	52		II.	Oc.	Re.	11	39			III.*	Oc.	Re.
3	57			I.	Tr.	Eg.	9	5			IV.	Sh.	In.	12	46			I.*	Tr.	In.
21	34	17		I.	Ec.	Dis.	13	37			IV.*	Sh.	Eg.	13	53			I.*	Sh.	Eg.
23	55			II.	Sh.	In.	15	11			I.*	Sh.	In.	15	6			I.*	Tr.	Eg.
4	1	8		I.	Oc.	Re.	16	26			I.*	Tr.	In.	23	8	45	12	I.	Ec.	Dis.
2	26			II.	Tr.	In.	17	31			I.*	Sh.	Eg.	12	16			I.*	Oc.	Re.
2	51			II.	Sh.	Eg.	18	46			I.	Tr.	Eg.	13	16	18		II.*	Ec.	Dis.
5	17			III.	Sh.	In.	20	44			IV.	Tr.	In.	18	39			II.	Oc.	Re.
5	22			II.	Tr.	Eg.	14	1	31		IV.	Tr.	Eg.	24	6	1		I.	Sh.	In.
8	54			III.	Sh.	Eg.	12	23	51		I.*	Ec.	Dis.	7	13			I.	Tr.	In.
10	25			III.	Tr.	In.	15	45			II.*	Sh.	In.	8	21			I.	Sh.	Eg.
14	7			III.*	Tr.	Eg.	15	57			I.*	Oc.	Re.	9	34			I.	Tr.	Eg.
18	48			I.	Sh.	In.	18	14			II.*	Tr.	In.	25	3	13	28	I.	Ec.	Dis.
20	5			I.	Tr.	In.	18	41			II.	Sh.	Eg.	6	43			I.	Oc.	Re.
21	8			I.	Sh.	Eg.	21	10			II.	Tr.	Eg.	7	35			II.	Sh.	In.
22	25			I.	Tr.	Eg.	23	9	14		III.	Ec.	Dis.	9	57			II.	Tr.	In.
5	0	29	59	IV.	Ec.	Dis.	15	2	38	9	III.	Ec.	Re.	10	31			II.*	Sh.	Eg.
4	52	38		IV.	Ec.	Re.	4	8			III.	Oc.	Dis.	12	53			II.*	Tr.	Eg.
12	35			IV.*	Oc.	Dis.	7	50			III.	Oc.	Re.	17	11			III.*	Sh.	In.
16	2	34		I.*	Ec.	Dis.	9	39			I.	Sh.	In.	20	50			III.	Sh.	Eg.
17	20			IV.*	Oc.	Re.	10	54			I.	Tr.	In.	22	0			III.	Tr.	In.
18	46	51		II.	Ec.	Dis.	11	59			I.*	Sh.	Eg.	26	0	29		I.	Sh.	In.
19	37			I.	Oc.	Re.	13	14			I.*	Tr.	Eg.	1	41			I.	Tr.	In.
6	0	18		II.	Oc.	Re.	16	6	52	7	I.	Ec.	Dis.	1	42			III.	Tr.	Eg.
13	17			I.*	Sh.	In.	10	25			I.	Oc.	Re.	2	49			I.	Sh.	Eg.
14	33			I.*	Tr.	In.	10	40	22		II.	Ec.	Dis.	4	1			I.	Tr.	Eg.
15	37			I.*	Sh.	Eg.	16	8			II.*	Oc.	Re.	21	41	47		I.	Ec.	Dis.
16	54			I.*	Tr.	Eg.	17	4	7		I.	Sh.	In.	27	1	11		I.	Oc.	Re.
7	10	30	48	I.	Ec.	Dis.	5	22			I.	Tr.	In.	2	34	42		II.	Ec.	Dis.
13	11			II.*	Sh.	In.	6	27			I.	Sh.	Eg.	7	54			II.	Oc.	Re.
14	5			I.*	Oc.	Re.	7	42			I.	Tr.	Eg.	18	58			I.	Sh.	In.
15	42			II.*	Tr.	In.	18	1	20	22	I.	Ec.	Dis.	20	9			I.	Tr.	In.
16	7			II.*	Sh.	Eg.	4	53			I.	Oc.	Re.	21	18			I.	Sh.	Eg.
18	39			II.	Tr.	Eg.	5	1			II.	Sh.	In.	22	29			I.	Tr.	Eg.
19	11	17		III.	Ec.	Dis.	7	29			II.	Tr.	In.	23	16	10	3	I.*	Ec.	Dis.
22	39	46		III.	Ec.	Re.	7	57			II.	Sh.	Eg.	19	38			I.	Oc.	Re.
8	0	15		III.	Oc.	Dis.	10	25			II.	Tr.	Eg.	20	51			II.	Sh.	In.
3	56			III.	Oc.	Re.	13	13			III.*	Sh.	In.	23	10			II.	Tr.	In.
7	45			I.	Sh.	In.	16	51			III.*	Sh.	Eg.	23	48			II.	Sh.	Eg.
9	2			I.	Tr.	In.	18	13			III.*	Tr.	In.	29	2	7		II.	Tr.	Eg.
10	5			I.	Sh.	Eg.	21	55			III.	Tr.	Eg.	7	4	12		III.	Ec.	Dis.
11	22			I.*	Tr.	Eg.	22	36			I.	Sh.	In.	10	33	57		III.*	Ec.	Re.
4	59	4		I.	Ec.	Dis.	23	50			I.	Tr.	In.	11	41			III.*	Oc.	Dis.
8	4	21		II.	Ec.	Dis.	19	0	56		I.	Sh.	Eg.	13	26			I.*	Sh.	In.
8	33			I.	Oc.	Re.	2	10			I.	Tr.	Eg.	14	36			I.*	Tr.	In.
13	35			II.*	Oc.	Re.	19	48	41		I.	Ec.	Dis.	15	23			III.*	Oc.	Re.
2	14			I.	Sh.	In.	23	20			I.	Oc.	Re.	15	46			I.*	Sh.	Eg.
3	30			I.	Tr.	In.	23	58	50		II.	Ec.	Dis.	16	56			I.*	Tr.	Eg.
4	34			I.	Sh.	Eg.	20	5	24		II.	Oc.	Re.	30	3	2		IV.	Sh.	In.
5	50			I.	Tr.	Eg.	17	4			I.*	Sh.	In.	7	37			IV.	Sh.	Eg.
23	27	19		I.	Ec.	Dis.	18	18			I.*	Tr.	In.	10	38	20		I.*	Ec.	Dis.
11	2	28		II.	Sh.	In.	19	24			I.	Sh.	Eg.	13	41			IV.*	Tr.	In.
3	1			I.	Oc.	Re.	20	38			I.	Tr.	Eg.	14	5			I.*	Oc.	Re.
4	58			II.	Tr.	In.	21	14	16	56	I.*	Ec.	Dis.	15	52	10		II.*	Ec.	Dis.
5	24			II.	Sh.	Eg.	17	48			I.*	Oc.	Re.	18	30			IV.*	Tr.	Eg.
7	55			II.	Tr.	Eg.	18	18			II.*	Sh.	In.	21	7			II.	Oc.	Re.
9	14			III.	Sh.	In.	18	29	20		IV.	Ec.	Dis.							

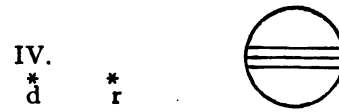
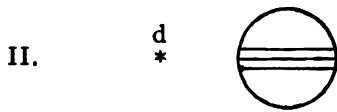
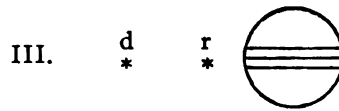
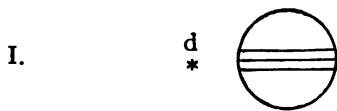
NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

WASHINGTON MEAN TIME.

NOVEMBER.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*



*Configurations at 14<sup>h</sup> 30<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.		
1	'4		'2 I'	○	'3		
2	'4			○	'2 'I		'3
3		'4	'I	○		2' 3'	
4			'4 2' 3'	○	I'		
5		3'	'2 'I	○			'4 ●
6		'3		○ <sup>1</sup>	'2'4		
7			'3	○ <sup>1</sup>		'4	
8		2'	I'	○	'3		'4
9				○	'2 'I	'3	'4
10			I'	○	2' 3'		4'
11	○ 3'		2'	○	I'		4'
12		3'	'2 'I	○		4'	
13		'3		○	I' 4'	'2	
14			'3 4'	○	2'		'I ●
15		4'	2' I'	○	'3		
16	4'			○	'I	'3	'2 ●
17	4'		I'	○		2' 3'	
18	'4		2'	○	3' I'		
19	'4		3' '2 'I	○			
20		4 <sup>3</sup>		○	I' '2		
21			'3 '4	○	2'		'I ●
22	○ I'		2'	○ <sup>3</sup> <sub>4</sub>			
23				○	'I	4 <sup>3</sup>	'2 ●
24			I'	○	2' 3'	'4	
25			2'	○	3' 'I		'4
26		3 <sup>2</sup>	'I	○			4'
27	3'			○	I' 4		4'
28		'3	'I	○	2'	4'	
29			2'	○ <sup>1</sup>	4'		'3 ●
30	○ 4'		'2	○	'I	'3	

## WASHINGTON MEAN TIME.

## DECEMBER.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	7	55		I.	11	7	46	14	II.	21	19	28		I.	21	19	28		Re.
9	3			I.	12	46			II.*	23	39	21		II.	23	39	21		Dis.
10	15			I.*	22	45			I.	22	4	18		II.	22	4	18		Re.
11	24			I.*	23	46			I.	13	36			I.*	13	36			In.
2	5	6	37	I.	12	1	5		I.	14	27			I.*	14	27			In.
8	33			I.	2	6			I.	15	56			I.*	15	56			Eg.
10	8			II.*	19	56	29		I.	16	47			I.*	16	47			Eg.
12	23			II.*	23	15			I.	23	10	46	32	I.*	23	10	46	32	Dis.
13	5			II.*	18	1	59		II.	13	55			I.*	13	55			Re.
15	20			II.*	3	58			II.	17	50			II.*	17	50			In.
21	10			III.	4	55			II.	19	29			II.	19	29			In.
8	0	49		III.	6	55			II.	20	46			II.	20	46			Eg.
1	42			III.	14	59	57		III.*	22	25			II.	22	25			Eg.
2	23			I.	17	14			I.*	24	8	4		I.	24	8	4		In.
3	31			I.	18	13			I.*	8	53			I.*	8	53			In.
4	43			I.	18	30	28		III.*	9	4			III.*	9	4			In.
5	25			III.	18	55			III.	10	24			I.*	10	24			Eg.
5	51			I.	19	34			I.	11	13			I.*	11	13			Eg.
23	34	57		I.	20	33			I.	12	20			III.*	12	20			In.
4	3	0		I.	22	38			III.	12	44			III.*	12	44			Eg.
5	10	30		II.	14	14	49		I.*	16	3			III.*	16	3			Eg.
10	21			II.*	17	42			I.*	25	5	14	58	I.	25	5	14	58	Dis.
20	52			I.	21	3	41		II.	6	28	56		IV.	6	28	56		Dis.
21	58			I.	15	1	57		II.	8	21			I.*	8	21			Re.
23	12			I.	11	42			I.*	11	2	15		IV.*	11	2	15		Re.
5	0	18		I.	12	40			I.*	12	57	30		II.*	12	57	30		Dis.
18	3	14		I.*	14	2			I.*	13	57			IV.*	13	57			Dis.
21	27			I.	15	0			I.*	17	28			II.*	17	28			Re.
23	25			II.	16	8	53	8	I.	18	49			IV.*	18	49			Re.
6	1	36		II.	12	8			I.*	26	2	33		I.	26	2	33		In.
2	21			II.	15	16			II.*	3	20			I.	3	20			In.
4	32			II.	17	9			II.*	4	53			I.	4	53			Eg.
11	2	1		III.*	18	12			II.*	5	40			I.	5	40			Eg.
14	32	10		III.*	20	6			II.	23	43	18		I.	23	43	18		Dis.
15	20			I.*	20	59			IV.	27	2	48		I.	27	2	48		Re.
15	21			III.*	17	1	38		IV.	7	7			II.	7	7			In.
16	25			I.*	5	6			III.	8	38			II.*	8	38			In.
17	40			I.*	5	40			IV.	10	3			II.*	10	3			Eg.
18	45			I.	6	10			I.	11	34			II.*	11	34			Eg.
19	3			III.	7	7			I.	21	1			I.	21	1			In.
7	12	31	32	I.*	8	30			I.	21	46			I.	21	46			In.
15	54			I.*	8	45			III.	22	56	48		III.	22	56	48		Dis.
18	27	58		II.*	8	52			III.	23	21			I.	23	21			Eg.
23	33			II.	9	27			I.*	28	0	6		I.	28	0	6		Eg.
8	9	48		I.*	10	31			IV.*	5	35			III.	5	35			Re.
10	52			I.*	12	35			III.*	18	11	42		I.*	18	11	42		Dis.
12	8			I.*	18	3	21	31	I.	21	14			I.	21	14			Re.
12	29	8		IV.*	6	35			I.	29	2	14	57	II.	29	2	14	57	Dis.
13	12			I.*	10	21	54		II.*	6	37			II.	6	37			Re.
16	59	14		IV.*	15	8			II.*	15	30			I.*	15	30			In.
22	30			IV.	19	0	39		I.	16	12			I.*	16	12			In.
9	3	20		IV.	1	33			I.	17	50			I.*	17	50			Eg.
6	59	50		I.	2	59			I.	18	33			I.*	18	33			Eg.
10	21			I.*	3	54			I.	30	12	40	4	I.*	30	12	40	4	Dis.
12	42			II.*	21	49	50		I.	15	40			I.*	15	40			Re.
14	47			II.*	20	1	1		I.	20	24			II.	20	24			In.
15	38			II.*	4	33			II.	21	47			II.	21	47			In.
17	44			II.*	6	19			II.	23	21			II.	23	21			Eg.
10	1	8		III.	7	29			II.	31	0	43		II.	31	0	43		Eg.
4	17			I.	9	16			II.*	9	58			I.*	9	58			In.
4	47			III.	18	58	36		III.	10	39			I.*	10	39			In.
5	19			I.	19	7			I.	12	18			I.*	12	18			Eg.
5	20			III.	20	0			I.	12	59			I.*	12	59			Eg.
6	37			I.	21	27			I.	13	2			III.*	13	2			In.
7	40			I.	22	20			I.	15	45			III.*	15	45			In.
9	2			III.	21	2	9		III.	16	42			III.*	16	42			Eg.
11	1	28	11	I.	16	18	12		I.*	19	27			III.	19	27			Eg.
4	48			I.															

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington

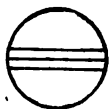


## WASHINGTON MEAN TIME.

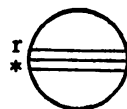
DECEMBER.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

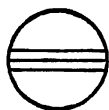
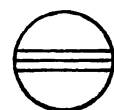
I.

d  
\*

III.

d  
\*

II.

d  
\*IV. d  
\*r  
\**Configurations at 14<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.		
1		4'	1'	○	'2	3'	
2	○ 2'	4'		○	'1	3'	
3	4'		'2 3'	○			
4	4'	3'		○	'2	1'	
5	'4	'3	'1	○	2'		
6	'4	2'		○	1'		'3 ●
7		'4	'2	○		'3	'1 ●
8			1'	○	'2	3'	'4 ●
9				○	2'	'1 '4 3'	
10		'2	1' 3'	○		'4	
11		3'		○	'2	'1	'4
12		'3	'1	○	2'		'4
13			2' '3	○	1'		4'
14		'2	'1	○	'3		4'
15	○ 1'			○	'2	4'	
16				○	'1	4' 3'	
17		2'	1' 4'	○			
18		4'		○	'1		'2 ●
19	4'	'3	'1	○	2'		
20	4'		'3 2'	○	1'		
21	'4		'2 '1	○	'3		
22	'4			○	1'	'2	'3
23	'4			○	'1	2'	3'
24	○ 3'	'4 2'	1'	○			
25		3'		○	'1		'2 ● '4 ●
26		'3	1'	○		4'	
27		'3	2'	○	1'		'4
28		'2	'1	○	'3		'4
29				○	1'	'2	'3
30				○	2'	3'	4' '1 ●
31		2'	1'	○	3'		4'

Satellite.	Mean Sidereal Revolution.	Semi-Major Axis at Mean Distance. (a)	The earth passes through the plane of the orbit,		Ratio of Mean Distance to True Distance from Earth.			
			North to South.	South to North.	Date.	$\frac{(p)}{p}$	Date.	$\frac{(p)}{p}$
Mimas	d h 0 22.6	26.8	May 19	. . .	May 20	0.952	Sept. 17	1.113
Enceladus	1 8.9	34.4	April 12	Oct. 4	June 9	0.982	Oct. 7	1.105
Tethys	1 21.3	42.6	May 3	Sept. 15	June 29	1.017	Oct. 27	1.083
Dione	2 17.7	54.6	April 12	Oct. 4	July 19	1.052	Nov. 16	1.052
Rhea	4 12.4	76.2	April 14	Sept. 30	Aug. 8	1.083	Dec. 6	1.017
Titan	15 22.7	176.6	April 15	Sept. 29	Aug. 28	1.105	Dec. 26	0.963
Hyperion	21 6.6	213.9	April 29	Sept. 12				
Iapetus	79 7.9	514.6	. . .	. . .				
Logarithm of Mean Distance (p) = 0.9795.								
Factor of the Apparent Semi-Major Axis.								
$\frac{s}{a}$	Mimas. P = 5°	Enceladus. P = 5°	Tethys. P = 5°	Dione. P = 5°	Rhea. P = 4°	Iapetus.		
						Days after Eastern Elongation.	$\frac{s}{a}$	P
	Hours from Eastern Elongation.							
1.00	± 0.0	± 0.0	± 0.0	± 0.0	± 0.0	0.0	1.00	82
0.95	1.1	1.7	2.3	3.3	5.5	2.0	0.99	80
0.90	1.6	2.4	3.3	4.7	7.8	4.0	0.95	79
0.85	2.0	2.9	4.0	5.8	9.6	6.0	0.89	77
0.80	2.3	3.4	4.6	6.7	11.1	8.0	0.81	76
0.70	2.8	4.2	5.7	8.3	13.7	10.0	0.71	74
0.60	3.3	4.9	6.7	9.7	16.0	12.0	0.59	71
0.50	3.8	5.5	7.6	10.9	18.0	14.0	0.46	66
0.40	4.2	6.1	8.4	12.1	20.0	16.0	0.33	56
0.30	4.6	6.6	9.1	13.2	21.8	18.0	0.20	39
0.20	4.9	7.2	9.9	14.3	23.6	20.0	0.13	349
0.10	5.3	7.7	10.6	15.4	25.4	22.0	0.21	301
0.00	± 5.7	± 8.2	± 11.3	± 16.4	± 27.1	24.0	0.34	284
	Titan. P = 4°		Hyperion. P = 4°			26.0	0.47	277
Days after Eastern Elongation.	$\frac{s}{a}$	Days after Eastern Elongation.	$\frac{s}{a}$			28.0	0.60	272
0.0	+ 1.03	0.0	+ 1.12			30.0	0.72	270
1.0	0.96	1.0	1.08			32.0	0.82	268
2.0	0.75	2.0	0.98			34.0	0.90	266
3.0	0.43	3.0	0.82			36.0	0.96	265
3.5	0.25	4.0	0.61			38.0	0.99	263
4.0	+ 0.06	5.0	0.36			40.0	1.00	262
4.5	- 0.14	6.0	+ 0.08			42.0	0.99	261
5.0	0.33	7.0	- 0.20			44.0	0.95	260
5.5	0.50	8.0	0.47			46.0	0.88	259
6.0	0.66	9.0	0.69			48.0	0.79	257
7.0	0.89	10.0	0.83			50.0	0.68	255
8.0	0.97	11.0	0.88			52.0	0.56	252
9.0	0.89	12.0	0.81			54.0	0.42	248
10.0	0.66	13.0	0.64			56.0	0.28	239
10.5	0.50	14.0	0.39			58.0	0.14	210
11.0	0.32	15.0	- 0.09			60.0	0.14	139
11.5	- 0.13	16.0	+ 0.22			62.0	0.27	107
12.0	+ 0.07	17.0	0.51			64.0	0.41	97
12.5	0.27	18.0	0.76			66.0	0.55	93
13.0	0.45	19.0	0.95			68.0	0.68	90
14.0	0.77	20.0	1.07			70.0	0.78	88
15.0	0.96	21.0	1.12			72.0	0.87	86
16.0	+ 1.03	22.0	+ 1.10			74.0	0.94	85
						76.0	0.98	84
						78.0	1.00	82
						80.0	0.99	81

## WASHINGTON MEAN TIME OF GREATEST ELONGATION, ETC.

In 1907 the earth passes through the planes of the orbits of the seven inner satellites on the days given on the preceding page and in the direction indicated. To find the apparent position of any one of the satellites at a given epoch, find the time elapsed since the last eastern elongation. From the tables on the preceding page find the corresponding factor of the apparent semi-major axis  $\frac{s}{a}$ , also the ratio of the mean to the true distance from the earth  $\frac{(\rho)}{\rho}$ , the semi-major axis at the mean distance ( $a$ ), and the position angle  $P$ . The satellites will be approximately at the distance  $\frac{s}{a} \frac{(\rho)}{\rho} (a)$  from the center of the primary on a line whose position angle is  $P$ . The times of eastern elongation may be found from the following tables. The time of any elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the period. Mimas can be seen only within a few hours of each elongation, and the time of every elongation visible at Washington is given. For the three outer satellites, the times both of the elongations and of the conjunctions are given. The following abbreviations are used in the tables:

- E., East Elongation.  
I., Inferior Conjunction.  
W., West Elongation.  
S., Superior Conjunction.

## MIMAS.

*Greatest Elongations Visible at Washington.*

June 28 14.3 E.	Aug. 7 15.5 W.	Sept. 3 11.9 E.	Sept. 26 14.1 W.	Oct. 20 14.6 E.	Nov. 15 12.7 W.
29 12.9 E.	8 14.1 W.	4 10.5 E.	27 12.7 W.	21 13.2 E.	16 11.3 W.
July 5 16.0 W.	9 12.8 W.	5 9.1 E.	28 11.3 W.	22 11.8 E.	17 9.9 W.
6 14.6 W.	10 11.4 W.	6 7.7 E.	29 9.9 W.	23 10.5 E.	18 8.5 W.
7 13.2 W.	11 10.0 W.	8 16.4 W.	30 8.5 W.	24 9.1 E.	19 7.1 W.
8 11.8 W.	15 15.6 E.	9 15.0 W.	Oct. 1 7.1 W.	25 7.7 E.	20 5.8 W.
13 16.2 E.	16 14.2 E.	10 13.6 W.	3 15.5 E.	26 6.3 E.	24 11.5 E.
14 14.8 E.	17 12.9 E.	11 12.3 W.	4 14.2 E.	29 13.6 W.	25 10.1 E.
15 13.4 E.	18 11.5 E.	12 10.9 W.	5 12.8 E.	30 12.2 W.	26 8.7 E.
16 12.0 E.	19 10.1 E.	13 9.5 W.	6 11.4 E.	31 10.8 W.	27 7.4 E.
17 10.6 E.	20 8.7 E.	14 8.1 W.	7 10.0 E.	Nov. 1 9.4 W.	28 6.0 E.
22 15.1 W.	23 16.0 W.	16 16.5 E.	8 8.6 E.	2 8.0 W.	Dec. 2 11.8 W.
23 13.7 W.	24 14.6 W.	17 15.1 E.	9 7.2 E.	3 6.6 W.	3 10.4 W.
24 12.3 W.	25 13.2 W.	18 13.7 E.	12 14.5 W.	6 13.7 E.	4 9.0 W.
25 10.9 W.	26 11.8 W.	19 12.3 E.	13 13.1 W.	7 12.4 E.	5 7.6 W.
26 9.5 W.	27 10.4 W.	20 10.9 E.	14 11.7 W.	8 11.0 E.	6 6.3 W.
30 15.2 E.	28 9.0 W.	21 9.5 E.	15 10.3 W.	9 9.6 E.	11 10.7 E.
31 13.8 E.	31 16.0 E.	22 8.2 E.	16 8.9 W.	10 8.2 E.	12 9.3 E.
Aug. 1 12.4 E.	Sept. 1 14.7 E.	23 6.8 E.	17 7.5 W.	11 6.8 E.	13 7.9 E.
2 11.0 E.	2 13.3 E.	25 15.5 W.	18 6.1 W.	12 5.4 E.	14 6.6 E.

## ENCELADUS.

June 9 14.3 E.	June 23 7.2 E.	July 7 0.1 E.	July 20 16.9 E.	Aug. 3 9.7 E.	Aug. 17 2.5 E.
10 23.2 E.	24 16.1 E.	8 9.0 E.	22 1.8 E.	4 18.6 E.	18 11.3 E.
12 8.1 E.	26 1.0 E.	9 17.8 E.	23 10.7 E.	6 3.4 E.	19 20.2 E.
13 17.0 E.	27 9.9 E.	11 2.7 E.	24 19.5 E.	7 12.3 E.	21 5.1 E.
15 1.9 E.	28 18.8 E.	12 11.6 E.	26 4.4 E.	8 21.2 E.	22 14.0 E.
16 10.8 E.	30 3.6 E.	13 20.5 E.	27 13.3 E.	10 6.1 E.	23 22.8 E.
17 19.7 E.	July 1 12.5 E.	15 5.4 E.	28 22.2 E.	11 15.0 E.	25 7.7 E.
19 4.6 E.	2 21.4 E.	16 14.2 E.	30 7.0 E.	12 23.8 E.	26 16.6 E.
20 13.4 E.	4 6.3 E.	17 23.1 E.	31 15.9 E.	14 8.7 E.	28 1.5 E.
21 22.3 E.	5 15.2 E.	19 8.0 E.	Aug. 2 0.8 E.	15 17.6 E.	29 10.3 E.

## WASHINGTON MEAN TIME OF GREATEST ELONGATION.

## ENCELADUS—(Concluded).

Aug. 30 19.2 E. Sept. 1 4.1 E. 2 13.0 E. 3 21.9 E. 5 6.7 E.  6 15.6 E. 8 0.5 E. 9 9.4 E. 10 18.3 E. 12 3.1 E.  13 12.0 E. 14 20.9 E. 16 5.7 E. 17 14.6 E. 18 23.5 E.	Sept. 20 8.4 E. 21 17.2 E. 23 2.1 E. 24 11.0 E. 25 19.9 E.  27 4.8 E. 28 13.6 E. 29 22.5 E. Oct. 1 7.4 E. 2 16.3 E.  4 1.1 E. 5 10.0 E. 6 18.9 E. 8 3.8 E. 9 12.7 E.	Oct. 10 21.5 E. 12 6.4 E. 13 15.3 E. 15 0.2 E. 16 9.0 E.  17 17.9 E. 19 2.8 E. 20 11.7 E. 21 20.6 E. 23 5.5 E.  24 14.3 E. 25 23.2 E. 27 8.1 E. 28 17.0 E. 30 1.9 E.	Oct. 31 10.8 E. Nov. 1 19.6 E. 3 4.5 E. 4 13.4 E. 5 22.3 E.  7 7.2 E. 8 16.1 E. 10 0.9 E. 11 9.8 E. 12 18.7 E.  14 3.6 E. 15 12.5 E. 16 21.4 E. 18 6.3 E. 19 15.2 E.	Nov. 21 0.0 E. 22 8.9 E. 23 17.8 E. 25 2.7 E. 26 11.6 E.  27 20.5 E. 29 5.4 E. 30 14.3 E. Dec. 1 23.2 E. 3 8.1 E.  4 16.9 E. 6 1.8 E. 7 10.7 E. 8 19.6 E. 10 4.5 E.	Dec. 11 13.4 E. 12 22.3 E. 14 7.2 E. 15 16.1 E. 17 1.0 E.  18 9.8 E. 19 18.7 E. 21 3.6 E. 22 12.5 E. 23 21.4 E.  25 6.3 E. 26 15.2 E. 28 0.1 E. 29 9.0 E. 30 17.9 E.
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## TETHYS.

June 11 18.3 E. 13 15.6 E. 15 13.0 E. 17 10.3 E. 19 7.6 E.  21 4.9 E. 23 2.2 E. 24 23.5 E. 26 20.8 E. 28 18.1 E.  July 30 15.4 E. 2 12.7 E. 4 10.1 E. 6 7.4 E. 8 4.7 E.  10 2.0 E. 11 23.3 E. 13 20.6 E.	July 15 17.9 E. 17 15.2 E. 19 12.5 E. 21 9.8 E. 23 7.1 E.  25 4.4 E. 27 1.7 E. 28 23.0 E. 30 20.3 E. Aug. 1 17.6 E.  3 14.9 E. 5 12.2 E. 7 9.5 E. 9 6.8 E. 11 4.0 E.  13 1.3 E. 14 22.6 E. 16 19.9 E.	Aug. 18 17.2 E. 20 14.5 E. 22 11.8 E. 24 9.1 E. 26 6.4 E.  28 3.7 E. 30 1.0 E. 31 22.3 E. Sept. 2 19.5 E. 4 16.8 E.  6 14.1 E. 8 11.4 E. 10 8.7 E. 12 6.0 E. 14 3.3 E.  16 0.6 E. 17 21.9 E. 19 19.2 E.	Sept. 21 16.5 E. 23 13.8 E. 25 11.1 E. 27 8.3 E. 29 5.6 E.  Oct. 1 2.9 E. 3 0.2 E. 4 21.5 E. 6 18.8 E. 8 16.1 E.  10 13.4 E. 12 10.7 E. 14 8.0 E. 16 5.3 E. 18 2.6 E.  19 23.9 E. 21 21.2 E. 23 18.5 E.	Oct. 25 15.8 E. 27 13.1 E. 29 10.4 E. 31 7.7 E. Nov. 2 5.0 E.  4 2.3 E. 5 23.6 E. 7 20.9 E. 9 18.2 E. 11 15.5 E.  13 12.8 E. 15 10.1 E. 17 7.4 E. 19 4.7 E. 21 2.0 E.  22 23.4 E. 24 20.7 E. 26 18.0 E.	Nov. 28 15.3 E. 30 12.6 E. Dec. 2 9.9 E. 4 7.2 E. 6 4.5 E.  8 1.9 E. 9 23.2 E. 11 20.5 E. 13 17.8 E. 15 15.1 E.  17 12.4 E. 19 9.8 E. 21 7.1 E. 23 4.4 E. 25 1.7 E.  26 23.0 E. 28 20.4 E. 30 17.7 E.
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## DIONE.

June 18 0.3 E. 20 18.0 E. 23 11.7 E. 26 5.4 E. 28 23.1 E.  July 1 16.8 E. 4 10.4 E. 7 4.1 E. 9 21.8 E. 12 15.5 E.  15 9.2 E. 18 2.8 E.	July 20 20.5 E. 23 14.2 E. 26 7.9 E. 29 1.5 E. 31 19.2 E.  Aug. 3 12.8 E. 6 6.5 E. 9 0.2 E. 11 17.8 E. 14 11.5 E.  17 5.2 E. 19 22.8 E.	Aug. 22 16.5 E. 25 10.1 E. 28 3.8 E. 30 21.4 E. Sept. 2 15.1 E.  5 8.7 E. 8 2.4 E. 10 20.0 E. 13 13.7 E. 16 7.4 E.  19 1.0 E. 21 18.7 E.	Sept. 24 12.3 E. 27 6.0 E. 29 23.6 E. Oct. 2 17.3 E. 5 10.9 E.  8 4.6 E. 10 22.2 E. 13 15.9 E. 16 9.6 E. 19 3.2 E.  21 20.9 E. 24 14.6 E.	Oct. 27 8.2 E. 30 1.9 E. Nov. 1 19.6 E. 4 13.2 E. 7 6.9 E.  10 0.6 E. 12 18.3 E. 15 12.0 E. 18 5.6 E. 20 23.3 E.  23 17.0 E. 26 10.7 E.	Nov. 29 4.4 E. Dec. 1 22.1 E. 4 15.8 E. 7 9.5 E. 10 3.2 E.  12 20.9 E. 15 14.6 E. 18 8.3 E. 21 2.0 E. 23 19.8 E.  26 13.5 E. 29 7.2 E.
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RHEA.			TITAN.			HYPERION.												
	d	h		d	h		d	h		d	h		d	h		d	h	
June	16	17.1 E.	Sept.	24	1.3 E.	July	9	2.6 S.	Oct.	4	21.6 I.	May	14.4 S.	Sept.	10.5 I.			
	21	5.6 E.		28	13.7 E.		13	5.0 E.		8	18.4 W.		20.4 E.		15.2 W.			
	25	18.0 E.		3	2.0 E.		17	8.6 I.		12	13.9 S.		26.7 I.		19.6 S.			
July	30	6.5 E.	Oct.	7	14.3 E.	Aug.	21	5.4 W.	Nov.	16	15.9 E.	June	31.4 W.	Oct.	25.5 E.			
	4	18.9 E.		12	2.7 E.		25	1.1 S.		20	19.3 I.		4.8 S.		1.8 I.			
	9	7.3 E.		16	15.0 E.		29	3.4 E.		24	16.2 W.		10.8 E.		6.4 W.			
Aug.	13	19.7 E.	Nov.	21	3.4 E.	Sept.	2	6.9 I.	Dec.	28	11.8 S.	July	17.2 I.	Nov.	10.8 S.			
	18	8.1 E.		25	15.7 E.		6	3.6 W.		1	13.8 E.		21.8 W.		16.8 E.			
	22	20.5 E.		30	4.1 E.		9	23.2 S.		5	17.3 I.		26.2 S.		23.1 I.			
Sept.	27	8.9 E.	Dec.	3	16.5 E.	Oct.	14	1.5 E.	Nov.	9	14.4 W.	Aug.	2.2 E.	Dec.	27.6 W.			
	31	21.3 E.		8	4.9 E.		18	4.8 I.		13	10.0 S.		8.6 I.		1.0 S.			
	5	9.6 E.		12	17.3 E.		22	1.5 W.		17	12.1 E.		13.2 W.		7.0 E.			
	9	22.0 E.		17	5.7 E.		25	21.1 S.		21	15.7 I.		17.6 S.		13.3 I.			
	14	10.3 E.		21	18.1 E.		29	23.2 E.		25	12.9 W.		23.6 E.		17.9 W.			
	18	22.7 E.		26	6.5 E.		3	2.5 I.		29	8.7 S.		30.0 I.		22.3 S.			
	23	11.0 E.		30	19.0 E.		6	23.2 W.		3	10.9 E.		3.6 W.		28.3 E.			
	27	23.4 E.		5	7.4 E.		10	18.7 S.		7	14.5 I.		8.0 S.		4.5 I.			
	1	11.7 E.		9	19.9 E.		14	20.7 E.		11	11.8 W.		14.0 E.		9.2 W.			
	6	0.0 E.		14	8.3 E.		19	0.0 I.		15	7.7 S.		20.3 I.		13.6 S.			
	10	12.4 E.		18	20.8 E.		22	20.8 W.		19	10.0 E.		24.9 W.		19.5 E.			
	15	0.7 E.		23	9.3 E.		26	16.3 S.		23	13.8 I.		29.3 S.		25.8 I.			
	19	13.0 E.		27	21.8 E.		30	18.2 E.		27	11.2 W.		4.3 E.		30.4 W.			

**IAPETUS.**

d	d	d	d	d	d
May 24.6 E.	July 4.3 W.	Aug. 12.1 E.	Sept. 20.9 W.	Oct. 29.3 E.	Dec. 8.6 W.
June 14.0 I.	23.8 S.	Sept. 1.0 I.	Oct. 10.1 S.	Nov. 18.3 I.	28.4 S.

### THE APPARENT ELEMENTS OF SATURN'S RINGS.

Washington Mean Noon.	<i>a</i>	<i>b</i>	<i>p</i>	<i>l</i>	<i>l'</i>	<i>u</i>	<i>u'</i>
	Outer Major Axis.	Outer Minor Axis.	Inclination of Northern Semi-minor Axis to Circle of Declination from North to East.	The Elevation of the Earth above the Plane of the Ring.	The Elevation of the Sun above the Plane of the Ring.	Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on—	
						Equator.	Ecliptic.
Jan. 0	37.17	3.48	5 36.6	+ 5 21.9	+ 3 1.9	36 36.8	353 56.7
20	36.24	2.84	5 28.8	4 29.2	2 44.4	38 12.1	355 32.0
Feb. 9	35.61	2.14	5 19.3	3 26.8	2 26.9	40 7.1	357 27.2
Mar. 1	35.32	1.43	5 8.5	2 19.1	2 9.2	42 14.0	359 34.1
21	35.36	0.73	4 57.0	1 10.6	1 51.6	44 24.3	1 44.5
Apr. 10	35.73	0.06	4 45.7	+ 0 5.6	+ 1 33.9	46 30.3	3 50.6
30	36.42	0.55	4 35.2	- 0 51.7	1 16.3	48 24.4	5 44.8
May 20	37.39	1.06	4 26.3	1 37.7	0 58.5	49 59.5	7 19.9
June 9	38.61	1.45	4 19.7	2 8.9	0 40.7	51 8.8	8 29.2
29	39.98	1.66	4 16.1	2 22.8	0 23.0	51 46.7	9 7.3
July 19	41.36	1.66	4 15.8	- 2 18.2	+ 0 5.2	51 49.3	9 9.9
Aug. 8	42.57	1.44	4 19.0	1 56.0	- 0 12.7	51 17.4	8 38.1
28	43.43	1.01	4 24.8	1 19.7	0 30.5	50 16.4	7 37.1
Sept. 17	43.75	0.46	4 32.2	- 0 36.2	0 48.4	48 58.3	6 19.1
Oct. 7	43.46	0.07	4 39.5	+ 0 5.8	1 6.3	47 38.8	4 59.7
27	42.62	0.46	4 45.5	+ 0 37.4	- 1 24.2	46 35.0	3 55.9
Nov. 16	41.39	0.62	4 48.6	0 52.3	1 42.2	45 59.7	3 20.7
Dec. 6	40.00	0.55	4 48.4	0 47.2	2 0.1	46 0.8	3 21.8
26	38.64	0.25	4 44.9	0 22.3	2 18.0	46 38.8	4 0.0
31	38.33	0.15	4 43.5	+ 0 13.3	- 2 22.5	46 53.8	4 15.0

The factor to be multiplied by  $a$  and  $b$  to obtain the axes of—

The inner ellipse of the outer ring = 0.8801,

**log factor = 9.9445**

The outer ellipse of the inner ring = 0.8599,

log factor = 9.9344

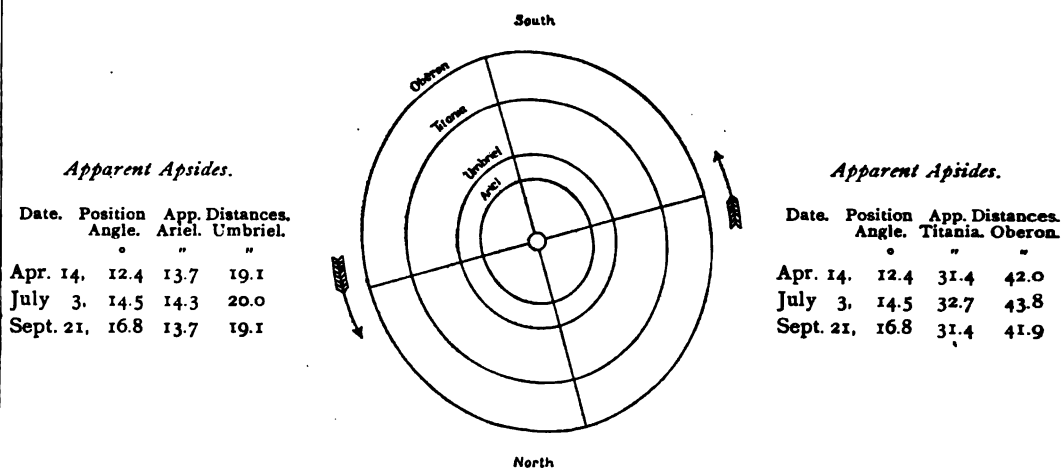
The inner ellipse of the inner ring = 0.6650,

**log factor = 9.8228**

The inner ellipse of the dusky ring = 0.5486,

**log factor = 9.7392**

**NOTE.**—The positive sign of  $l$  indicates that the visible surface of the ring is the northern one.

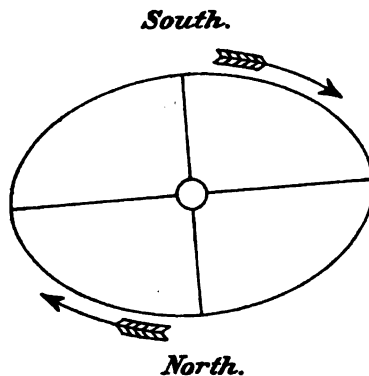


*APPARENT ORBITS OF THE SATELLITES OF URANUS AT DATE OF OPPOSITION,  
JULY 3, 1907, AS SEEN IN AN INVERTING TELESCOPE.*

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
Apr. 24 12.9	Apr. 28 7.6	Apr. 19 8.9	Apr. 21 10.6	Apr. 17 16.5	Apr. 22 1.0	May 13 12.3 S.
May 2 2.4	May 5 21.1	27 15.8	29 17.6	26 9.5	30 18.0	20 6.0 N.
9 15.8	13 10.6	May 5 22.8	May 8 0.5	May 5 2.4	May 9 10.9	26 23.6 S.
17 5.3	21 0.0	14 5.7	16 7.4	13 19.4	18 3.9	June 2 17.3 N.
24 18.8	28 13.5	22 12.6	24 14.4	22 12.4	26 20.9	9 11.0 S.
June 1 8.3	June 5 3.0	30 19.6	June 1 21.3	31 5.5	June 4 13.9	16 4.7 N.
8 21.8	12 16.5	June 8 2.5	10 4.3	June 8 22.5	13 7.0	22 22.5 S.
16 11.3	20 6.0	16 9.5	18 11.3	17 15.6	22 0.1	29 16.2 N.
24 0.8	27 19.5	24 16.5	26 18.2	26 8.7	30 17.2	July 6 9.9 S.
July 1 14.3	July 5 9.0	July 2 23.5	July 5 1.2	July 5 1.8	July 9 10.3	13 3.7 N.
9 3.8	12 22.5	11 6.5	13 8.2	13 18.9	18 3.4	19 21.4 S.
16 17.3	20 12.0	19 13.5	21 15.2	22 12.0	26 20.4	26 15.2 N.
24 6.8	28 1.5	27 20.5	29 22.2	31 5.1	Aug. 4 13.5	Aug. 2 8.9 S.
31 20.3	Aug. 4 15.0	Aug. 5 3.5	Aug. 7 5.2	Aug. 8 22.2	13 6.6	9 2.6 N.
Aug. 8 9.8	12 4.6	13 10.5	15 12.2	17 15.2	21 23.7	15 20.3 S.
15 23.3	19 18.1	21 17.5	23 19.2	26 8.3	30 16.8	22 14.0 N.
23 12.8	27 7.6	30 0.4	Sept. 1 2.2	Sept. 4 1.3	Sept. 8 9.8	29 7.7 S.
31 2.3	Sept. 3 21.1	Sept. 7 7.4	9 9.1	12 18.3	17 2.8	Sept. 5 1.4 N.
Sept. 7 15.8	11 10.6	15 14.3	17 16.1	21 11.3	25 19.7	11 19.0 S.
15 5.3	19 0.1	23 21.3	25 23.0	30 4.2	Oct. 4 12.7	18 12.6 N.
22 18.8	26 13.5	Oct. 2 4.2	Oct. 4 5.9	Oct. 8 21.1	13 5.6	25 6.1 S.
30 8.3	Oct. 4 3.0	10 11.1	12 12.8	17 14.0	21 22.5	Oct. 1 23.6 N.
Oct. 7 21.8	11 16.5	18 18.0	20 19.7	26 6.8	30 15.3	8 17.1 S.
15 11.2	19 6.0	27 0.9	29 2.6	Nov. 3 23.6	Nov. 8 8.1	15 10.6 N.
23 0.7	26 19.4	Nov. 4 7.8	Nov. 6 9.5	12 16.4	17 0.9	22 4.1 S.
Period of Ariel, d h 2 12.489		Period of Titania, d h 8 16.942		Period of Oberon, d h 13 11.119		
Period of Umbriel, 4 3.460						

NOTE.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



Date.	Position Angle of Apsis. °	Apparent Distance at Apsis. "
Jan. 2,	94.1	16.8
Apr. 12,	92.4	16.2
Sept. 3,	97.9	16.0
Dec. 32,	96.9	16.8

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION,  
JANUARY 2, 1907, AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

East.		West.		East.		West.		East.		West.	
d	h	d	h	d	h	d	h	d	h	d	h
Jan.	5 17.8	Jan. 2	19.2	Mar.	23 4.2	Mar.	26 2.7	Oct.	14 18.2	Oct.	17 16.7
	11 14.9	8 16.4			29 1.2		31 23.8		20 15.2		23 13.7
	17 12.1	14 13.5			3 22.3		6 20.8		26 12.2		29 10.8
	23 9.2	20 10.6			9 19.3		12 17.8		Nov. 1 9.3		Nov. 4 7.8
		26 7.8			15 16.3		18 14.8		7 6.3		10 4.9
Feb.	29 6.3	Feb. 1	4.9	Sept.	21 13.3	Sept.	24 11.9	Dec.	13 3.4	Dec.	16 1.9
	4 3.5	7 2.0			3 15.2		6 13.7		19 0.5		21 23.0
	10 0.6	12 23.1			9 12.2		12 10.7		24 21.6		27 20.1
	15 21.7	18 20.2			15 9.2		18 7.6		30 18.7		3 17.2
	21 18.8	24 17.3							6 15.8		9 14.3
Mar.	27 15.9	Mar. 2	14.4	Oct.	21 6.2	Oct.	24 4.6		12 12.9		15 11.5
	5 13.0	8 11.5			27 3.1		30 1.6		18 10.0		21 8.6
	11 10.0	14 8.6			3 0.1		5 22.6		24 7.1		27 5.7
	17 7.1	20 5.7			8 21.1		11 19.6		30 4.3		33 2.8

The above times are the instants of each passage of the satellite through the apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, bearing in mind that the radius vector of the satellite describes equal areas in equal times.

The period of the satellite of Neptune is  $5^d 21^h.044$ .

NOTE.—In the preceding diagrams the central circle represents the planet and is on the same scale as the orbits.

## WASHINGTON MEAN TIME.

## PLANETARY CONFIGURATIONS.

		d	h	m			d	h	m			d	h	m	
Jan.	1	14	-	-	☉	in Perihelion.	Mar.	30	1	-	♂	Stationary.			
	2	2	-	-	♂	♂	31	1	-	☐	♂	♂	♂	♂	
	3	16	-	-	♂	in ♄	Apr.	1	15	-	♂	♂	♂	♂	
	4	2	-	-	♀	Greatest brilliancy.	2	20	-	☐	♂	♂	♂	♂	
	7	10	-	-	♀	in Perihelion.	3	23	40	♂	♂	♂	♂	♂	
	8	19	24	♂	♂	♂	4	19	1	♂	♂	♂	♂	♂	
	10	12	4	♂	♂	♂	8	12	-	♂	♂	♂	♂	♂	
	12	12	-	♂	♂	♂	8	18	18	♂	♂	♂	♂	♂	
	12	15	27	♂	♂	♂	9	17	16	♂	♂	♂	♂	♂	
	12	15	48	♂	♂	♂	9	18	45	♂	♂	♂	♂	♂	
	13	21	-	♂	in Aphelion.		11	21	-	♂	in Aphelion.				
	13	-	-	☉	Total eclips. invis. at Wash.		14	11	-	♂	Greatest elong. W. 27 36				
	16	21	6	♂	♂	♂	17	6	-	♂	Stationary.				
	25	20	56	♂	♂	♂	18	1	49	♂	♂	♂	♂	♂	
	26	13	20	♂	♂	♂	18	12	0	♂	♂	♂	♂	♂	
	28	-	-	☉	Part. ec. partly vis. at Wash.		20	22	-	♂	♂	♂	♂	♂	
	29	10	-	♀	Greatest Hel. Lat. N.		29	19	-	♀	in Aphelion.				
Feb.	2	0	-	♂	♂	♂	May	1	6	-	♂	♂	♂	♂	
	3	6	-	♂	Greatest Hel. Lat. S.		2	0	59	♂	♂	♂	♂	♂	
	6	7	40	♂	♂	♂	2	1	27	♂	♂	♂	♂	♂	
	7	8	-	♂	in ♄		2	6	-	♂	Greatest Hel. Lat. S.				
	8	12	-	♀	Greatest elong. W. 46 53		7	4	4	♂	♂	♂	♂	♂	
	8	13	42	♂	♂	♂	8	15	54	♂	♂	♂	♂	♂	
	9	3	41	♂	♂	♂	10	6	23	♂	♂	♂	♂	♂	
	12	14	53	♂	♂	♂	15	18	35	♂	♂	♂	♂	♂	
	13	12	42	♂	♂	♂	15	20	27	♂	♂	♂	♂	♂	
	17	6	-	♂	♂	♂	21	6	-	♂	in ♄				
	20	18	-	♂	♂	♂	21	7	-	♂	♂	♂	♂	♂	
	22	1	28	♂	♂	♂	22	8	-	♂	♂	♂	♂	♂	
	22	7	-	♂	in ♄		23	15	-	♂	♂	♂	♂	♂	
	22	19	51	♂	♂	♂	25	20	-	♂	in Perihelion.				
	25	3	-	♂	Stationary.		29	8	14	♂	♂	♂	♂	♂	
	26	21	-	♂	in Perihelion.		29	19	34	♂	♂	♂	♂	♂	
Mar.	1	9	-	♂	Greatest elong. E. 18 10		June	3	13	6	♂	♂	♂	♂	
	6	17	18	♂	♂	♂	5	3	-	♂	Greatest Hel. Lat. N.				
	7	17	-	♂	Stationary.		5	9	-	♂	Stationary.				
	8	12	38	♂	♂	♂	7	19	54	♂	♂	♂	♂	♂	
	8	16	-	♂	♂	♂	12	4	0	♂	♂	♂	♂	♂	
	9	4	-	♂	Greatest Hel. Lat. N.		12	4	39	♂	♂	♂	♂	♂	
	9	12	-	☐	♂	♂	12	9	-	♂	♂	♂	♂	♂	
	10	1	33	♂	♂	♂	12	12	30	♂	♂	♂	♂	♂	
	13	4	0	♂	♂	♂	15	3	-	♂	♂	♂	♂	♂	
	13	19	46	♂	♂	♂	18	20	-	☐	♂	♂	♂	♂	
	17	15	-	♂	♂	♂	21	21	-	☉	enters ♄, Summer com.				
	21	1	-	☉	enters ♏, Spring com.		25	16	56	♂	♂	♂	♂	♂	
	21	8	-	♂	Stationary.		26	1	48	♂	♂	♂	♂	♂	
	21	11	30	♂	♂	♂	26	18	-	♂	Greatest elong. E. 25 29				
	22	3	35	♂	♂	♂	28	14	-	♂	in ♄				
	23	4	-	☐	♂	♂	30	21	29	♂	♂	♂	♂	♂	
	23	20	-	♂	♂	♂	July	3	3	-	♂	♂	♂	♂	
	26	12	-	♀	in ♄		4	20	-	♂	♂	♂	♂	♂	
	28	16	-	♂	in ♄		4	22	-	☉	in Aphelion.				



WASHINGTON MEAN TIME.

PLANETARY CONFIGURATIONS.

July			Sept.		
d	h	m	d	h	m
5	22	-	23	12	-
8	5	14	24	14	-
8	20	-	25	20	-
9	12	41	29	13	57
9	23	-	Oct. 1	13	16
9	-	-	2	12	-
10	6	51	4	19	-
10	8	-	7	1	48
11	12	35	8	4	40
12	12	-	8	14	-
15	14	-	12	22	27
17	15	-	14	12	22
19	2	-	18	1	11
21	2	-	18	11	-
23	0	45	22	18	-
23	2	1	25	4	-
24	10	-	26	22	9
24	-	-	29	4	26
28	5	43	Nov. 3	4	-
29	5	-	5	12	-
31	11	-	6	4	-
31	20	-	6	4	44
Aug. 1	0	-	6	7	2
3	12	-	6	23	-
5	20	51	9	5	47
6	22	53	11	4	-
7	1	22	11	23	3
7	15	0	13	4	-
8	13	-	13	19	-
10	10	-	13	-	-
12	10	-	14	5	15
17	5	-	17	19	-
19	8	28	22	21	-
19	10	5	23	5	20
20	2	-	25	7	-
21	20	-	25	15	25
24	4	-	28	1	-
24	13	34	30	17	-
Sept. 1	2	-	30	21	-
1	11	-	Dec. 3	4	41
2	5	20	6	5	36
3	3	-	6	16	18
3	19	46	10	10	-
6	11	-	10	12	36
6	21	40	11	10	47
7	3	10	11	17	-
11	3	-	13	11	-
14	8	-	20	11	11
15	16	35	21	13	-
16	6	4	22	7	-
17	9	-	22	20	58
18	5	-	30	22	-
20	20	13	31	18	-

POSITIONS OF OBSERVATORIES.					
(North Latitudes and West Longitudes are Considered Positive.)					
Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.	
				From Washington	From Greenwich.
	° ' "	' "		h m s	h m s
Abastuman . . .	+41 42 24	- 11 35.5	9.999 351	- 7 59 41	- 2 51 25
Abo . . .	+60 26 56.8	- 10 2.1	9.998 887	- 6 37 22.20	- 1 29 6.42
Adelaide . . .	-34 55 38.5	+ 10 56.8	9.999 520	+ 9 37 23.92	- 9 14 20.30
Albany ( <i>New Obs.</i> ) . .	+42 39 12.7	- 11 38.0	9.999 326	- 0 13 9.0	+ 4 55 6.8
Albany ( <i>Old Obs.</i> ) . .	+42 39 49.5	- 11 38.0	9.999 326	- 0 13 15.79	+ 4 54 59.99
Alfred ( <i>N. Y.</i> ) . . .	+42 15 19.8	- 11 37.0	9.999 337	+ 0 2 51.37	+ 5 11 7.15
Algiers ( <i>Old Obs.</i> ) . .	+36 44 0	- 11 10.8	9.999 476	- 5 20 32.6	- 0 12 16.8
Algiers ( <i>New Obs.</i> ) . .	+36 47 50	- 11 11.3	9.999 474	- 5 20 24.33	- 0 12 8.55
Allegheny . . .	+40 27 41.6	- 11 31.3	9.999 383	+ 0 11 47.15	+ 5 20 2.93
Altona . . .	+53 32 45.3	- 11 10.2	9.999 049	- 5 48 2.02	- 0 39 46.24
Amherst . . .	+42 22 17.1	- 11 37.3	9.999 334	- 0 18 11.11	+ 4 50 4.67
Annapolis . . .	+38 58 53.5	- 11 24.5	9.999 420	- 0 2 19.29	+ 5 5 56.49
Ann Arbor . . .	+42 16 48.0	- 11 37.0	9.999 336	+ 0 26 39.41	+ 5 34 55.19
Arequipa ( <i>Harvard</i> ) . .	-16 24	+ 6 18.4	9.999 884	- 0 22 46	+ 4 45 30
Armagh . . .	+54 21 12.7	- 11 4.2	9.999 029	- 4 41 40.4	+ 0 26 35.4
Athens . . .	+37 58 20.7	- 11 18.9	9.999 445	- 6 43 8.70	- 1 34 52.92
Bamberg . . .	+49 53 6.0	- 11 30.7	9.999 141	- 5 51 49.43	- 0 43 33.65
Beloit . . .	+42 30 8.4	- 11 37.6	9.999 331	+ 0 47 51.5	+ 5 56 7.3
Bergen . . .	+60 23 54	- 10 2.7	9.998 888	- 5 29 28.53	- 0 21 12.75
Berkeley . . .	+37 52 23.6	- 11 18.3	9.999 448	+ 3 0 46.94	+ 8 9 2.72
Berlin . . .	+52 30 16.7	- 11 17.1	9.999 075	- 6 1 50.63	- 0 53 34.85
Berlin ( <i>Urania</i> ) . . .	+52 31 30.7	- 11 17.0	9.999 075	- 6 1 43.23	- 0 53 27.45
Berne . . .	+46 57 8.7	- 11 39.0	9.999 216	- 5 38 1.51	- 0 29 45.73
Besançon . . .	+47 14 59.0	- 11 38.5	9.999 208	- 5 32 12.95	- 0 23 57.17
Bethlehem . . .	+40 36 23.1	- 11 31.9	9.999 379	- 0 6 43.93	+ 5 1 31.85
Birr Castle . . .	+53 5 47.0	- 11 13.3	9.999 060	- 4 36 34.9	+ 0 31 40.9
Bogota . . .	+ 4 36 15.4	- 1 51.5	9.999 991	- 0 11 21.58	+ 4 56 54.20
Bologna . . .	+44 29 54	- 11 40.3	9.999 279	- 5 53 40.7	- 0 45 24.9
Bombay . . .	+18 53 45	- 7 8.1	9.999 847	- 9 59 31.52	- 4 51 15.74
Bonn . . .	+50 43 45.0	- 11 26.9	9.999 120	- 5 36 39.00	- 0 28 23.22
Bordeaux . . .	+44 50 7.2	- 11 40.4	9.999 271	- 5 6 10.24	+ 0 2 5.54
Boston ( <i>University</i> ) . .	+42 21 32.5	- 11 37.2	9.999 334	- 0 24 0.8	+ 4 44 15.0
Bothkamp . . .	+54 12 9.6	- 11 5.3	9.999 033	- 5 48 47.0	- 0 40 31.2
Breslau . . .	+51 6 55.8	- 11 25.0	9.999 110	- 6 16 24.57	- 1 8 8.79
Brisbane . . .	-27 28 0.0	+ 9 32.2	9.999 689	+ 8 39 37.82	-10 12 6.40
Brussels ( <i>Uccle</i> ) . . .	+50 47 53	- 11 26.6	9.999 118	- 5 25 42.7	- 0 17 26.9
Brussels ( <i>Old Obs.</i> ) . .	+50 51 10.7	- 11 26.3	9.999 117	- 5 25 44.51	- 0 17 28.73
Budapest . . .	+47 29 34.7	- 11 38.0	9.999 202	- 6 24 31.1	- 1 16 15.3
Cairo . . .	+30 4 38.2	- 10 6.5	9.999 632	- 7 13 24.69	- 2 5 8.91
Cambridge ( <i>England</i> ) . .	+52 12 51.6	- 11 18.9	9.999 082	- 5 8 38.53	- 0 0 22.75
Cambridge ( <i>Mass.</i> ) . . .	+42 22 47.6	- 11 37.3	9.999 334	- 0 23 44.73	+ 4 44 31.05
Cape of Good Hope . .	-33 56 3.6	+ 10 48.0	9.999 543	- 6 22 10.54	- 1 13 54.76
Catania . . .	+37 30 13.3	- 11 16.0	9.999 457	- 6 8 36	- 1 0 20
Chapultepec . . .	+19 25 17.5	- 7 18.2	9.999 838	+ 1 28 22.52	+ 6 36 38.30
Charkow . . .	+50 0 9.6	- 11 30.2	9.999 138	- 7 33 11.55	- 2 24 55.77

## POSITIONS OF OBSERVATORIES.

*(North Latitudes and West Longitudes are Considered Positive.)*

Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.	
				From Washington.	From Greenwich.
	° ' "	° ' "		h m s	h m s
Charlottesville . . .	+38 2 1.2	-11 19.3	9.999 444	+ 0 54 49.44	+ 5 14 5.22
Chicago ( <i>Old Obs.</i> ) . .	+41 50 1.0	-11 35.9	9.999 348	+ 0 42 11.06	+ 5 50 26.84
Christiania . . .	+59 54 44.0	-10 8.7	9.998 899	- 5 51 9.30	- 0 42 53.52
Cincinnati ( <i>New Obs.</i> ) .	+39 8 19.5	-11 25.4	9.999 416	+ 0 29 25.62	+ 5 37 41.40
Cincinnati ( <i>Old Obs.</i> ) .	+39 6 26.5	-11 25.2	9.999 417	+ 0 29 43.22	+ 5 37 59.00
Clinton . . .	+43 3 17.0	-11 38.7	9.999 316	- 0 6 38.33	+ 5 1 37.45
Coimbra . . .	+40 12 24.5	-11 30.3	9.999 389	- 4 34 32.7	+ 0 33 43.1
Columbia ( <i>Missouri</i> ) . .	+38 56 51.7	-11 24.4	9.999 421	+ 1 1 2.55	+ 6 9 18.33
Copenhagen . . .	+55 41 12.9	-10 53.1	9.998 997	- 5 58 34.48	- 0 50 18.70
Cordoba . . .	-31 25 15.2	+10 22.2	9.999 602	- 0 51 27.56	+ 4 16 48.22
Cracow . . .	+50 3 52.0	-11 29.9	9.999 137	- 6 28 6.06	- 1 19 50.28
Crowborough . . .	+51 3 14	-11 25.4	9.999 112	- 5 8 54	- 0 0 38
Dantzig . . .	+54 21 18.0	-11 4.1	9.999 029	- 6 22 55.4	- 1 14 39.6
Denver . . .	+39 40 36.4	-11 27.9	9.999 402	+ 1 51 31.85	+ 6 59 47.63
Dorpat . . .	+58 22 47.1	-10 26.4	9.998 934	- 6 55 9.07	- 1 46 53.29
Dresden . . .	+51 2 16.8	-11 25.4	9.999 112	- 6 3 10.63	- 0 54 54.85
Dublin . . .	+53 23 13.1	-11 11.3	9.999 053	- 4 42 54.7	+ 0 25 21.1
Dun Echt . . .	+57 9 36	-10 39.2	9.998 962	- 4 58 35.8	+ 0 9 40.0
Durham . . .	+54 46 6.2	-11 0.9	9.999 019	- 5 1 56.03	+ 0 6 19.75
Düsseldorf . . .	+51 12 25.0	-11 24.6	9.999 108	- 5 35 20.8	- 0 27 5.0
Edinburgh ( <i>Calton Hill</i> )	+55 57 23.2	-10 50.7	9.998 991	- 4 55 32.7	+ 0 12 43.1
Edinburgh ( <i>Royal Obs.</i> )	+55 55 28.0	-10 50.9	9.998 991	- 4 55 31.6	+ 0 12 44.2
Evanston ( <i>Dearborn</i> ) . .	+42 3 33.4	-11 36.5	9.999 342	+ 0 42 26.5	+ 5 50 42.3
Flagstaff ( <i>Lowell</i> ) . .	+35 12 30.4	-10 59.2	9.999 513	+ 2 18 28.79	+ 7 26 44.57
Florence ( <i>Reale Museo</i> )	+43 46 4.1	-11 39.7	9.999 298	- 5 53 17.3	- 0 45 1.5
Florence ( <i>Arctetri</i> ) . .	+43 45 14.6	-11 39.7	9.999 298	- 5 53 17.12	- 0 45 1.34
Geneva . . .	+46 11 58.8	-11 39.9	9.999 236	- 5 32 52.49	- 0 24 36.71
Genoa . . .	+44 25 9.3	-11 40.2	9.999 281	- 5 43 57.11	- 0 35 41.33
Georgetown . . .	+38 54 26.7	-11 24.2	9.999 422	+ 0 0 2.48	+ 5 8 18.26
Glasgow ( <i>Missouri</i> ) . .	+39 13 45.6	-11 25.8	9.999 414	+ 1 3 2.30	+ 6 11 18.08
Glasgow ( <i>Scotland</i> ) . .	+55 52 42.8	-10 51.5	9.998 993	- 4 51 5.23	+ 0 17 10.55
Gohlis . . .	+51 21 35.0	-11 23.7	9.999 104	- 5 57 45.43	- 0 49 29.65
Gotha ( <i>Old Obs.</i> ) . .	+50 56 5.2	-11 26.0	9.999 114	- 5 51 10.88	- 0 42 55.10
Gotha . . .	+50 56 37.9	-11 25.9	9.999 114	- 5 51 6.27	- 0 42 50.49
Göttingen . . .	+51 31 47.9	-11 22.8	9.999 100	- 5 48 2.07	- 0 39 46.29
Graz . . .	+47 4 37.2	-11 38.8	9.999 213	- 6 10 4	- 1 1 48
Greenwich . . .	+51 28 38.1	-11 23.1	9.999 101	- 5 8 15.78	0 0 0.00
Grignon . . .	+47 33 42	-11 37.8	9.999 201	- 5 25 54	- 0 17 38
Hamburg . . .	+53 33 7.0	-11 10.1	9.999 049	- 5 48 9.6	- 0 39 53.8
Hanover . . .	+43 42 15.3	-11 39.6	9.999 300	- 0 19 7.87	+ 4 49 7.91
Harrow . . .	+51 34 47.1	-11 22.6	9.999 098	- 5 6 55.92	+ 0 1 19.86
Hastings-on-Hudson . .	+40 59 25	-11 33.2	9.999 369	- 0 12 46.33	+ 4 55 29.45
Haverford . . .	+40 0 40.1	-11 29.4	9.999 394	- 0 7 3.08	+ 5 1 12.70
Heidelberg . . .	+49 24 35	-11 32.5	9.999 153	- 5 43 4.3	- 0 34 48.5
Helsingfors . . .	+60 9 42.6	-10 5.6	9.998 893	- 6 48 4.93	- 1 39 49.15

POSITIONS OF OBSERVATORIES.					
(North Latitudes and West Longitudes are Considered Positive.)					
Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.	
				From Washington.	From Greenwich.
	° ' "	' "		h m s	h m s
Hereny . . . . .	+47 15 47.4	- 11 38.4	9.999 208	- 6 14 40.5	- 1 6 24.7
Hongkong . . . . .	+22 18 13.4	- 8 10.7	9.999 789	+11 15 2.36	- 7 36 41.86
Hudson . . . . .	+41 14 42.6	- 11 34.1	9.999 363	+ 0 17 25.5	+ 5 25 41.3
Jamaica . . . . .	+18 24 51	- 6 58.7	9.999 854	+ 0 3 13.70	+ 5 11 29.48
Jena ( <i>University</i> ) . . . . .	+50 55 34.9	- 11 26.0	9.999 115	- 5 54 36.05	- 0 46 20.27
Kalocsa . . . . .	+46 31 41.7	- 11 39.6	9.999 227	- 6 24 10.12	- 1 15 54.34
Karlsruhe . . . . .	+49 0 29.6	- 11 33.9	9.999 163	- 5 41 52.2	- 0 33 36.4
Kasan . . . . .	+55 47 24.3	- 10 52.2	9.998 995	- 8 24 44.82	- 3 16 29.04
Kew . . . . .	+51 28 6	- 11 23.2	9.999 101	- 5 7 0.7	+ 0 1 15.1
Kiel . . . . .	+54 20 28.5	- 11 4.2	9.999 030	- 5 48 51.42	- 0 40 35.64
Kiew . . . . .	+50 27 10.5	- 11 28.2	9.999 127	- 7 10 16.42	- 2 2 0.64
Kis Kartal . . . . .	+47 41 54.8	- 11 37.5	9.999 197	- 6 26 27.5	- 1 18 11.7
Königsberg . . . . .	+54 42 50.4	- 11 1.3	9.999 021	- 6 30 14.82	- 1 21 59.04
Kremsmünster . . . . .	+48 3 23.1	- 11 36.7	9.999 188	- 6 4 47.37	- 0 56 31.59
La Plata . . . . .	-34 54 30.3	+ 10 56.7	9.999 520	- 1 16 38.8	+ 3 51 37.0
Leiden . . . . .	+52 9 20.0	- 11 19.3	9.999 084	- 5 26 11.95	- 0 17 56.17
Leipzig . . . . .	+51 20 5.9	- 11 23.9	9.999 104	- 5 57 49.76	- 0 49 33.98
Liege ( <i>Cointe, Ougrle</i> ) . . . . .	+50 37 7	- 11 27.5	9.999 123	- 5 30 31.0	- 0 22 15.2
Lisbon ( <i>Marine Obs.</i> ) . . . . .	+38 42 17.6	- 11 23.3	9.999 427	- 4 31 42.20	+ 0 36 33.58
Lisbon ( <i>Royal Obs.</i> ) . . . . .	+38 42 31.3	- 11 23.1	9.999 427	- 4 31 31.10	+ 0 36 44.68
Liverpool . . . . .	+53 24 4.8	- 11 11.2	9.999 053	- 4 55 58.45	+ 0 12 17.33
Lübec . . . . .	+53 51 31.1	- 11 7.9	9.999 042	- 5 51 1.5	- 0 42 45.7
Lund . . . . .	+55 41 51.6	- 10 53.0	9.998 997	- 6 1 0.79	- 0 52 45.01
Lussinpiccolo ( <i>Manora</i> ) . . . . .	+44 32 11.0	- 11 40.3	9.999 278	- 6 6 8.19	- 0 57 52.41
Lyons . . . . .	+45 41 41.0	- 11 40.3	9.999 248	- 5 27 24.33	- 0 19 8.55
Madison . . . . .	+43 4 36.8	- 11 38.7	9.999 316	+ 0 49 22.15	+ 5 57 37.93
Madras . . . . .	+13 4 8.0	- 5 7.6	9.999 925	- 10 29 14.90	- 5 20 59.12
Madrid . . . . .	+40 24 29.7	- 11 31.1	9.999 384	- 4 53 30.66	+ 0 14 45.12
Manila . . . . .	+14 35 25	- 5 40.5	9.999 907	+10 47 54	- 8 3 50
Mannheim . . . . .	+49 29 11.0	- 11 32.2	9.999 151	- 5 42 6.23	- 0 33 50.45
Marburg . . . . .	+50 48 46.9	- 11 26.5	9.999 118	- 5 43 20.7	- 0 35 4.9
Markree . . . . .	+54 10 31.8	- 11 5.5	9.999 034	- 4 34 27.4	+ 0 33 48.4
Marseilles . . . . .	+43 18 17.5	- 11 39.1	9.999 310	- 5 29 50.37	- 0 21 34.59
Mauritius . . . . .	-20 5 39	+ 7 30.8	9.999 828	- 8 58 28.4	- 3 50 12.6
Melbourne . . . . .	-37 49 53.4	+ 11 18.1	9.999 449	+ 9 11 50.2	- 9 39 54.0
Meudon . . . . .	+48 48 18	- 11 34.6	9.999 169	- 5 17 11.4	- 0 8 55.6
Mexico . . . . .	+19 26 1.3	- 7 18.4	9.999 838	+ 1 28 10.95	+ 6 36 26.73
Middletown ( <i>Conn.</i> ) . . . . .	+41 33 16.0	- 11 35.1	9.999 355	- 0 17 38.60	+ 4 50 37.18
Milan . . . . .	+45 27 59.3	- 11 40.4	9.999 254	- 5 45 1.70	- 0 36 45.92
Modena . . . . .	+44 38 52.8	- 11 40.4	9.999 275	- 5 51 58.7	- 0 43 42.9
Moncalieri . . . . .	+44 59 51	- 11 40.4	9.999 266	- 5 39 5	- 0 30 49
Montreal . . . . .	+45 30 17.0	- 11 40.4	9.999 253	- 0 13 57.15	+ 4 54 18.63
Montsouris . . . . .	+48 49 18.0	- 11 34.5	9.999 168	- 5 17 36.46	- 0 9 20.68
Moscow . . . . .	+55 45 19.8	- 10 52.5	9.998 995	- 7 38 32.87	- 2 30 17.09
Mount Hamilton ( <i>Lick</i> ) . . . . .	+37 20 25.6	- 11 14.9	9.999 461	+ 2 58 19.11	+ 8 6 34.89
Munich . . . . .	+48 8 45.5	- 11 36.5	9.999 186	- 5 54 41.85	- 0 46 26.07

## POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.	
				From Washington.	From Greenwich.
	° ' "	' "		h m s	h m s
Naples . . . . .	+ 40 51 46.3	- 11 32.8	9.999 372	- 6 5 17.51	- 0 57 1.73
Nashville . . . . .	+ 36 8 54.4	- 11 6.6	9.999 490	+ 0 38 56.4	+ 5 47 12.2
Natal . . . . .	- 29 50 46.6	+ 10 3.7	9.999 637	- 7 12 16.96	- 2 4 1.18
Neuchatel . . . . .	+ 47 0 1.2	- 11 38.9	9.999 215	- 5 36 5.71	- 0 27 49.93
New Haven ( <i>Old Obs.</i> )	+ 41 18 36.5	- 11 34.3	9.999 361	- 0 16 33.64	+ 4 51 42.14
New Haven ( <i>Yale Univ.</i> )	+ 41 19 22.3	- 11 34.4	9.999 361	- 0 16 35.20	+ 4 51 40.58
New York ( <i>Columb. Coll.</i> )	+ 40 45 23.1	- 11 32.4	9.999 375	- 0 12 22.14	+ 4 55 53.64
New York ( <i>RUTHERFURD</i> )	+ 40 43 48.5	- 11 32.3	9.999 376	- 0 12 19.10	+ 4 55 56.68
Nice . . . . .	+ 43 43 16.9	- 11 39.6	9.999 299	- 5 37 27.96	- 0 29 12.18
Nicolaëff . . . . .	+ 46 58 21.8	- 11 38.9	9.999 216	- 7 16 9.58	- 2 7 53.80
Northfield . . . . .	+ 44 27 41.6	- 11 40.3	9.999 280	+ 1 4 20.03	+ 6 12 35.81
Oakland ( <i>Cal.</i> ) . . . . .	+ 37 48 5	- 11 17.9	9.999 449	+ 3 0 50.77	+ 8 9 6.55
Odessa . . . . .	+ 46 28 36.7	- 11 39.6	9.999 228	- 7 11 17.88	- 2 3 2.10
Ogden . . . . .	+ 41 13 8.6	- 11 34.0	9.999 363	+ 2 19 43.85	+ 7 27 59.63
O-Gyalla . . . . .	+ 47 52 27.3	- 11 37.1	9.999 192	- 6 21 1.32	- 1 12 45.54
Olmütz . . . . .	+ 49 35 43	- 11 31.8	9.999 149	- 6 17 24	- 1 9 8
Oxford ( <i>Mississippi</i> ) . . . . .	+ 34 22 12.6	- 10 52.0	9.999 533	+ 0 49 51.3	+ 5 58 7.1
Oxford ( <i>Radcliffe</i> ) . . . . .	+ 51 45 35.4	- 11 21.6	9.999 094	- 5 3 13.2	+ 0 5 2.6
Oxford ( <i>University</i> ) . . . . .	+ 51 45 34.2	- 11 21.6	9.999 094	- 5 3 15.4	+ 0 5 0.4
Padua . . . . .	+ 45 24 5	- 11 40.4	9.999 256	- 5 55 44.97	- 0 47 29.19
Palermo . . . . .	+ 38 6 44.0	- 11 19.7	9.999 442	- 6 1 41.68	- 0 53 25.90
Paramatta . . . . .	- 33 48 49.8	+ 10 46.9	9.999 546	+ 8 47 44.0	- 10 4 0.2
Paris . . . . .	+ 48 50 11.2	- 11 34.5	9.999 168	- 5 17 36.75	- 0 9 20.97
Philadelphia . . . . .	+ 39 57 7.5	- 11 29.2	9.999 396	- 0 7 37.27	+ 5 0 38.51
Philadelphia ( <i>Flower</i> ) . . . . .	+ 39 58 2.1	- 11 29.2	9.999 395	- 0 7 9.2	+ 5 1 6.6
Plonsk . . . . .	+ 52 37 40.0	- 11 16.4	9.999 072	- 6 29 47.8	- 1 21 32.0
Pola . . . . .	+ 44 51 48.7	- 11 40.4	9.999 270	- 6 3 38.67	- 0 55 22.89
Portsmouth . . . . .	+ 50 48 3	- 11 26.6	9.999 118	- 5 3 51.0	+ 0 4 24.8
Potsdam . . . . .	+ 52 22 56.0	- 11 17.9	9.999 078	- 6 0 31.7	- 0 52 15.9
Poughkeepsie . . . . .	+ 41 41 18	- 11 35.5	9.999 351	- 0 12 42.13	+ 4 55 33.65
Prague ( <i>University</i> ) . . . . .	+ 50 5 15.8	- 11 29.8	9.999 136	- 6 5 56.1	- 0 57 40.3
Princeton . . . . .	+ 40 20 57.8	- 11 30.8	9.999 385	- 0 9 38.17	+ 4 58 37.61
Princeton ( <i>Halsted</i> ) . . . . .	+ 40 20 55.8	- 11 30.9	9.999 386	- 0 9 36.34	+ 4 58 39.44
Providence ( <i>SEAGRAVE</i> ) . . . . .	+ 41 49 46.4	- 11 35.9	9.999 348	- 0 22 38.14	+ 4 45 37.64
Providence ( <i>Ladd</i> ) . . . . .	+ 41 50 21	- 11 35.9	9.999 348	- 0 22 39.83	+ 4 45 35.95
Pulkowa . . . . .	+ 59 46 18.7	- 10 10.4	9.998 902	- 7 9 34.42	- 2 1 18.64
Quebec . . . . .	+ 46 47 59.2	- 11 39.2	9.999 220	- 0 23 23.14	+ 4 44 52.64
Quito . . . . .	- 0 14 0	+ 0 5.7	0.000 000	+ 0 5 50.88	+ 5 14 6.66
Riga . . . . .	+ 56 57 9.3	- 10 41.3	9.998 967	- 6 44 43.95	- 1 36 28.17
Rio de Janeiro . . . . .	- 22 54 23.6	+ 8 21.1	9.999 779	- 2 15 34.4	+ 2 52 41.4
Rochester . . . . .	+ 43 9 16.8	- 11 38.8	9.999 314	+ 0 2 6.00	+ 5 10 21.78
Rome ( <i>Coll. Rom.</i> ) . . . . .	+ 41 53 53.6	- 11 36.1	9.999 346	- 5 58 11.33	- 0 49 55.55
Rome ( <i>Capitol</i> ) . . . . .	+ 41 53 33.5	- 11 36.0	9.999 346	- 5 58 12.15	- 0 49 56.37
Rome ( <i>Vatican</i> ) . . . . .	+ 41 54 4.8	- 11 36.1	9.999 346	- 5 58 5.25	- 0 49 49.47
Rousdon . . . . .	+ 50 42 38	- 11 27.0	9.999 120	- 4 56 16.84	+ 0 11 58.94
Rugby . . . . .	+ 52 22 7	- 11 18.0	9.999 079	- 5 3 13.8	+ 0 5 2.0

POSITIONS OF OBSERVATORIES.					
(North Latitudes and West Longitudes are Considered Positive.)					
Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.	
				From Washington.	From Greenwich.
	° ' "	' "		h m s	h m s
San Fernando . . .	+ 36 27 42.0	- 11 8.9	9.999 483	- 4 43 26.6	+ 0 24 49.2
San Francisco . . .	+ 37 47 27.9	- 11 17.8	9.999 450	+ 3 1 27.08	+ 8 9 42.86
Santiago de Chile . . .	- 33 26 42.0	+ 10 43.4	9.999 555	- 0 25 29.56	+ 4 42 46.22
South Hadley . . .	+ 42 15 18.2	- 11 37.0	9.999 337	- 0 17 55.49	+ 4 50 20.29
Speier . . .	+ 49 18 55.2	- 11 32.9	9.999 156	- 5 42 1.34	- 0 33 45.56
St. Louis . . .	+ 38 38 3.0	- 11 22.7	9.999 429	+ 0 52 33.48	+ 6 0 49.26
St. Petersburg ( <i>Academy</i> ) . . .	+ 59 56 29.7	- 10 8.4	9.998 898	- 7 9 29.24	- 2 1 13.46
St. Petersburg ( <i>Univ.</i> ) . . .	+ 59 56 32.0	- 10 8.4	9.998 898	- 7 9 27.2	- 2 1 11.4
Stockholm . . .	+ 59 20 33.0	- 10 15.5	9.998 912	- 6 20 29.77	- 1 12 13.99
Stonyhurst . . .	+ 53 50 40	- 11 8.0	9.999 042	- 4 58 23.10	+ 0 9 52.68
Strassburg ( <i>New Obs.</i> ) . . .	+ 48 35 0.3	- 11 35.3	9.999 174	- 5 39 20.47	- 0 31 4.69
Strassburg ( <i>Old Obs.</i> ) . . .	+ 48 34 53.8	- 11 35.3	9.999 174	- 5 39 18.27	- 0 31 2.49
Sydney . . .	- 33 51 41.1	+ 10 47.3	9.999 545	+ 8 46 54.68	- 10 4 49.54
Syracuse . . .	+ 43 2 13.1	- 11 38.6	9.999 317	- 0 3 42.42	+ 5 4 33.36
Tacubaya . . .	+ 19 24 17.5	- 7 17.8	9.999 839	+ 1 28 30.75	+ 6 36 46.53
Taschkent . . .	+ 41 19 31.3	- 11 34.4	9.999 361	- 9 45 26.58	- 4 37 10.80
Tokio . . .	+ 35 39 17.5	- 11 2.8	9.999 502	+ 9 32 46.20	- 9 18 58.02
Toronto . . .	+ 43 39 35.9	- 11 39.6	9.999 301	+ 0 9 18.87	+ 5 17 34.65
Toulouse . . .	+ 43 36 45	- 11 39.5	9.999 302	- 5 14 5.66	- 0 5 49.88
Trieste . . .	+ 45 38 45.4	- 11 40.3	9.999 250	- 6 3 18.73	- 0 55 2.95
Troy ( <i>N. Y.</i> ) . . .	+ 42 43 52.9	- 11 38.1	9.999 325	- 0 13 33.49	+ 4 54 42.29
Tulse Hill . . .	+ 51 26 47.0	- 11 23.3	9.999 102	- 5 7 48.1	+ 0 0 27.7
Turin . . .	+ 45 4 8.0	- 11 40.4	9.999 265	- 5 39 2.96	- 0 30 47.18
Tuscaloosa ( <i>Ala. Univ.</i> ) . . .	+ 33 12 36.8	- 10 41.1	9.999 561	+ 0 41 55.96	+ 5 50 11.74
Twickenham . . .	+ 51 27 4.2	- 11 23.3	9.999 102	- 5 7 2.7	+ 0 1 13.1
Upsala ( <i>New Obs.</i> ) . . .	+ 59 51 29.4	- 10 9.3	9.998 900	- 6 18 45.93	- 1 10 30.15
Utrecht . . .	+ 52 5 9.6	- 11 19.7	9.999 086	- 5 28 46.8	- 0 20 31.0
Venice . . .	+ 45 26 10.5	- 11 40.4	9.999 255	- 5 57 37.90	- 0 49 22.12
Vienna ( <i>Josephstadt</i> ) . . .	+ 48 12 53.8	- 11 36.2	9.999 183	- 6 13 41.1	- 1 5 25.3
Vienna ( <i>New Obs.</i> ) . . .	+ 48 13 55.4	- 11 36.2	9.999 183	- 6 13 37.17	- 1 5 21.39
Vienna ( <i>Old Obs.</i> ) . . .	+ 48 12 35.5	- 11 36.3	9.999 184	- 6 13 47.42	- 1 5 31 64
Vienna ( <i>Ottakring</i> ) . . .	+ 48 12 46.7	- 11 36.2	9.999 183	- 6 13 26.89	- 1 5 11.11
Warsaw . . .	+ 52 13 4.7	- 11 18.9	9.999 082	- 6 32 23.06	- 1 24 7.28
Washington . . .	+ 38 55 14.0	- 11 24.2	9.999 422	0 0 0.00	+ 5 8 15.78
Washington ( <i>Old Obs.</i> ) . . .	+ 38 53 38.8	- 11 24.1	9.999 422	- 0 0 3.63	+ 5 8 12.15
Washington ( <i>Smithsonian</i> ) . . .	+ 38 53 17.3	- 11 24.1	9.999 422	- 0 0 9.6	+ 5 8 6.2
Washington ( <i>Cath. Univ.</i> ) . . .	+ 38 56 14.8	- 11 24.2	9.999 422	- 0 0 15.78	+ 5 8 0.00
Wellington . . .	- 41 18 0.6	+ 11 34.3	9.999 361	+ 7 12 37.70	- 11 39 6.52
West Point ( <i>Old Obs.</i> ) . . .	+ 41 23 31	- 11 34.6	9.999 359	- 0 12 26.34	+ 4 55 49.44
West Point ( <i>New Obs.</i> ) . . .	+ 41 23 22.1	- 11 34.6	9.999 359	- 0 12 25.23	+ 4 55 50.55
Wilhelmshaven . . .	+ 53 31 52.2	- 11 10.3	9.999 050	- 5 40 50.89	- 0 32 35.11
Williamstown ( <i>Mass.</i> ) . . .	+ 42 42 30	- 11 38.0	9.999 325	- 0 15 26	+ 4 52 50
Williamstown ( <i>Victoria</i> ) . . .	- 37 52 7.2	+ 11 18.3	9.999 448	+ 9 12 6.1	- 9 39 38.1
Wilna . . .	+ 54 40 59.1	- 11 1.6	9.999 021	- 6 49 24.60	- 1 41 8.82
Windsor . . .	- 33 36 30.8	+ 10 44.9	9.999 551	+ 8 48 23.7	- 10 3 20.5
Zürich . . .	+ 47 22 40.0	- 11 38.2	9.999 205	- 5 42 28.08	- 0 34 12.30

## PART IV.

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APPARENT PLACES OF STARS, STAR-NUMBERS,  
AND OTHER DATA,

BASED ON THE CONSTANTS OF THE  
PARIS CONFERENCE OF 1896.

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF THE PARIS CONFERENCE OF MAY, 1896.

NOTATION.

- $\tau$ , the time reckoned in units of one year, from the beginning of the Besselian fictitious year, (1907, January 0<sup>d</sup>.795, Washington mean time),  
 $a_0, \delta_0$ , the star's mean right ascension and declination at the beginning of the fictitious year,  
 $a, \delta$ , the star's apparent right ascension and declination at the time  $\tau$ ,  
 $\mu, \mu'$ , the annual proper motion in right ascension and declination,  
 $\odot$ , the Sun's true longitude,  
 $L$ , the Sun's mean longitude,  
 $\Omega$ , the longitude of the Moon's ascending node, |  $\omega$ , the obliquity of the ecliptic,  
 $\Gamma'$ , the longitude of the Moon's perigee,  
 $\zeta$ , the Moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$\begin{aligned} A = & \tau - 0.34217 \sin \Omega & + 0.00024 \sin (\zeta + \Gamma') \\ & + 0.00415 \sin 2\Omega & + 0.00133 \sin (\zeta - \Gamma') \\ & - 0.02495 \sin 2L & - 0.00068 \sin (2\zeta - \Omega) \\ & + 0.00218 \sin (L + 75^\circ.3) & - 0.00052 \sin (3\zeta - \Gamma') \\ & - 0.00097 \sin (3L + 78^\circ.7) & + 0.00030 \sin (\zeta - 2L + \Gamma') \\ & + 0.00024 \sin (2L - \Omega) & + 0.00012 \sin 2(\zeta - L) \\ & - 0.00405 \sin 2\zeta & \\ B = & - 9.210 \cos \Omega & + 0.007 \cos (2L - \Omega) \\ & + 0.090 \cos 2\Omega & - 0.088 \cos 2\zeta \\ & - 0.546 \cos 2L & - 0.018 \cos (2\zeta - \Omega) \\ & - 0.021 \cos (3L + 78^\circ.7) & - 0.011 \cos (3\zeta - \Gamma') \\ & + 0.009 \cos (L - 78^\circ.7) & + 0.005 \cos (\zeta + \Gamma') \\ C = & - 20.4700 \cos \omega \cos \odot \\ D = & - 20.4700 \sin \odot \\ E = & - 0.0423 \sin \Omega + 0''.0005 \sin 2\Omega - 0''.0031 \sin 2L \end{aligned}$$

BESSEL'S Star-Constants.

$$\begin{aligned} a &= 3^\circ.07246 + 1^\circ.33642 \sin a_0 \tan \delta_0 = \text{precession in right ascension} \\ b &= \frac{1}{18} \cos a_0 \tan \delta_0 \\ c &= \frac{1}{18} \cos a_0 \sec \delta_0 \\ d &= \frac{1}{18} \sin a_0 \sec \delta_0 \\ a' &= 20''.0462 \cos a_0 = \text{precession in declination} \\ b' &= -\sin a_0 \\ c' &= \tan \omega \cos \delta_0 - \sin a_0 \sin \delta_0 \\ d' &= \cos a_0 \sin \delta_0 \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned} a &= a_0 + \tau \mu + Aa + Bb + Cc + Dd + \frac{1}{18} E & (\text{in time}) \\ \delta &= \delta_0 + \tau \mu' + Aa' + Bb' + Cc' + Dd' & (\text{in arc}) \end{aligned}$$

INDEPENDENT STAR-NUMBERS.

$$\begin{aligned} f &= f' + f'' = + 46''.0870 A + E \text{ (in arc)} = 3^\circ.07246 A + \frac{1}{18} E & (\text{in time}) \\ f' &= - 0^\circ.0124 \sin 2\zeta + 0^\circ.0041 \sin (\zeta - \Gamma') + 0^\circ.0007 \sin (\zeta + \Gamma') \\ & - 0^\circ.0021 \sin (2\zeta - \Omega) - 0^\circ.0016 \sin (3\zeta - \Gamma') \\ & + 0^\circ.0009 \sin (\zeta - 2L + \Gamma') + 0^\circ.0004 \sin 2(\zeta - L) \\ g \sin G &= B & h \sin H &= C \\ g \cos G &= 20''.0462 A & h \cos H &= D & i &= C \tan \omega \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned} a &= a_0 + f + \tau \mu + \frac{1}{18} g \sin (G + a_0) \tan \delta_0 + \frac{1}{18} h \sin (H + a_0) \sec \delta_0 & (\text{in time}) \\ \delta &= \delta_0 + \tau \mu' + g \cos (G + a_0) + h \cos (H + a_0) \sin \delta_0 + i \cos \delta_0 & (\text{in arc}) \end{aligned}$$

NOTES.—(1) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*,  $a, b, c, d, a', b', c', d'$ , with the star-numbers of this Ephemeris, the quantities to be formed are  $Ac, Bd, Ca, Db, -Ac', -Bd', -Ca', -Db'$ .



(CONSTANTS OF PARIS CONFERENCE.)

FOR GREENWICH MEAN NOON.							
Date.	Precession in Longitude from 1907.0.	Nutation.			Obliquity of Ecliptic. (Newcomb.)	The Sun's Aberration.	
		In Longitude.	In R. A.	In Obliquity.			
Jan. 0	— 0.14	— 14.12	— 0.863	— 5.64	23° 26' 59.34"	— 20.81	
10	+ 1.24	13.80	0.844	5.46	59.51	20.81	
20	2.61	13.57	0.830	5.25	59.71	20.80	
30	3.99	13.46	0.823	4.99	59.95	20.77	
Feb. 9	5.37	13.52	0.827	4.73	23° 27' 0.20"	20.74	
19	+ 6.74	— 13.73	— 0.839	— 4.47	23° 27' 0.45"	— 20.70	
Mar. 1	8.12	14.08	0.861	4.23	0.67	20.65	
11	9.49	14.53	0.889	4.06	0.83	20.60	
21	10.87	15.03	0.919	3.96	0.92	20.54	
31	12.24	15.53	0.949	3.91	0.96	20.48	
Apr. 10	+ 13.62	— 15.97	— 0.977	— 3.92	23° 27' 0.93"	— 20.42	
20	15.00	16.33	1.000	3.99	0.85	20.36	
30	16.37	16.57	1.015	4.08	0.74	20.31	
May 10	17.75	16.67	1.020	4.18	0.63	20.26	
20	19.12	16.63	1.017	4.28	0.52	20.22	
30	+ 20.50	— 16.46	— 1.006	— 4.35	23° 27' 0.44"	— 20.18	
June 9	21.87	16.21	0.991	4.37	0.40	20.15	
19	23.25	15.91	0.972	4.34	0.42	20.14	
29	24.63	15.59	0.952	4.25	0.50	20.13	
July 9	26.00	15.28	0.935	4.09	0.64	20.13	
19	+ 27.38	— 15.06	— 0.921	— 3.90	23° 27' 0.82"	— 20.14	
29	28.75	14.94	0.913	3.67	1.04	20.16	
Aug. 8	30.13	14.95	0.914	3.40	1.29	20.18	
18	31.51	15.09	0.923	3.16	1.53	20.22	
28	32.88	15.35	0.939	2.93	1.76	20.26	
Sept. 7	+ 34.26	— 15.73	— 0.963	— 2.71	23° 27' 1.95"	— 20.31	
17	35.63	16.18	0.989	2.56	2.09	20.36	
27	37.01	16.66	1.018	2.47	2.17	20.42	
Oct. 7	38.38	17.13	1.047	2.44	2.18	20.48	
17	39.76	17.52	1.072	2.46	2.15	20.54	
27	+ 41.14	— 17.81	— 1.089	— 2.54	23° 27' 2.06"	— 20.60	
Nov. 6	42.51	17.95	1.097	2.64	1.94	20.65	
16	43.89	17.93	1.096	2.76	1.81	20.70	
26	45.26	17.76	1.087	2.84	1.72	20.74	
Dec. 6	46.64	17.46	1.069	2.90	1.65	20.77	
16	+ 48.01	— 17.07	— 1.046	— 2.89	23° 27' 1.64"	— 20.80	
26	49.39	16.62	1.019	2.82	1.70	20.81	
36	+ 50.77	— 16.21	— 0.991	— 2.68	23° 27' 1.84"	— 20.81	
Mean Obliquity 1907.0    23° 27' 4".98 (Newcomb).							
Precession for 1907    . . . . . 50.2575 log = 1.70120							
Precession in a Solar Day    . . . . . 0.1376 log = 9.13862							
Precession in a Sidereal Day    . . . . . 0.1372 log = 9.13743							

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Jan. 0	-9.44518	+0.7542	-0.49817	+1.30492	Feb. 15	-9.16095	+0.6492	-1.19427	+1.05418
1	9.43854	0.7511	0.54129	1.30354	16	9.15860	0.6481	1.19926	1.04244
2	9.43271	0.7474	0.58040	1.30201	17	9.15515	0.6481	1.20406	1.03024
3	9.42797	0.7433	0.61614	1.30034	18	9.15005	0.6487	1.20866	1.01756
4	9.42438	0.7395	0.64905	1.29853	19	9.14336	0.6493	1.21309	1.00436
h (7.0) 5	-9.42162	+0.7368	-0.67950	+1.29657	h (10.0) 20	-9.13513	+0.6495	-1.21733	+0.99061
6	9.41911	0.7354	0.70784	1.29446	21	9.12558	0.6490	1.22140	0.97629
7	9.41614	0.7356	0.73430	1.29220	22	9.11511	0.6474	1.22530	0.96135
8	9.41192	0.7370	0.75912	1.28980	23	9.10425	0.6447	1.22902	0.94574
9	9.40594	0.7389	0.78247	1.28724	24	9.09367	0.6408	1.23258	0.92942
10	-9.39822	+0.7404	-0.80449	+1.28453	25	-9.08433	+0.6358	-1.23598	+0.91234
11	9.38888	0.7408	0.82532	1.28166	26	9.07700	0.6300	1.23922	0.89442
12	9.37882	0.7395	0.84507	1.27864	27	9.07232	0.6242	1.24229	0.87560
13	9.36892	0.7366	0.86382	1.27546	28	9.07004	0.6192	1.24522	0.85581
14	9.36001	0.7323	0.88166	1.27211	Mar. 1	9.06945	0.6158	1.24799	0.83494
15	-9.35272	+0.7273	-0.89867	+1.26860	2	-9.06904	+0.6145	-1.25060	+0.81288
16	9.34723	0.7224	0.91489	1.26493	3	9.06726	0.6153	1.25307	0.78951
17	9.34325	0.7182	0.93040	1.26108	4	9.06254	0.6175	1.25540	0.76469
18	9.34013	0.7153	0.94524	1.25707	5	9.05396	0.6202	1.25757	0.73823
19	9.33722	0.7137	0.95945	1.25288	6	9.04159	0.6221	1.25961	0.70992
h (8.0) 20	-9.33385	+0.7131	-0.97307	+1.24851	h (11.0) 7	-9.02617	+0.6225	-1.26150	+0.67952
21	9.32964	0.7133	0.98614	1.24396	8	9.00949	0.6207	1.26325	0.64669
22	9.32432	0.7138	0.99870	1.23922	9	8.99357	0.6168	1.26486	0.61105
23	9.31790	0.7141	1.01077	1.23430	10	8.98055	0.6115	1.26633	0.57210
24	9.31042	0.7140	1.02237	1.22918	11	8.97146	0.6057	1.26767	0.52919
25	-9.30211	+0.7131	-1.03353	+1.22386	12	-8.96638	+0.6004	-1.26887	+0.48144
26	9.29325	0.7112	1.04428	1.21834	13	8.96445	0.5965	1.26993	0.42766
27	9.28427	0.7083	1.05464	1.21261	14	8.96384	0.5945	1.27086	0.36616
28	9.27575	0.7042	1.06461	1.20667	15	8.96289	0.5944	1.27166	0.29438
29	9.26818	0.6992	1.07423	1.20051	16	8.96033	0.5957	1.27232	0.20824
30	-9.26217	+0.6936	-1.08350	+1.19413	17	-8.95525	+0.5978	-1.27286	+0.10058
31	9.25782	0.6882	1.09244	1.18751	18	8.94743	0.6002	1.27325	9.95704
Feb. 1	9.25510	0.6837	1.10107	1.18066	19	8.93697	0.6023	1.27352	9.74111
2	9.25310	0.6807	1.10939	1.17356	20	8.92418	0.6037	1.27366	+9.29261
3	9.25091	0.6795	1.11742	1.16620	21	8.90950	0.6041	1.27367	-9.19997
h (9.0) 4	-9.24741	+0.6799	-1.12517	+1.15858	h (12.0) 22	-8.89382	+0.6032	-1.27354	-9.70997
5	9.24172	0.6812	1.13265	1.15069	23	8.87806	0.6011	1.27329	9.93792
6	9.23343	0.6826	1.13987	1.14251	24	8.86356	0.5977	1.27291	0.08646
7	9.22264	0.6830	1.14683	1.13404	25	8.85181	0.5934	1.27239	0.19678
8	9.21029	0.6817	1.15355	1.12527	26	8.84379	0.5890	1.27175	0.28452
9	-9.19761	+0.6784	-1.16003	+1.11618	27	-8.83973	+0.5851	-1.27098	-0.35732
10	9.18597	0.6735	1.16627	1.10676	28	8.83879	0.5827	1.27007	0.41951
11	9.17653	0.6675	1.17230	1.09700	29	8.83872	0.5825	1.26904	0.47376
12	9.16982	0.6614	1.17810	1.08688	30	8.83721	0.5846	1.26787	0.52183
13	9.16554	0.6559	1.18370	1.07638	31	8.83129	0.5885	1.26658	0.56497
14	-9.16289	+0.6517	-1.18909	+1.06549	Apr. 1	-8.81895	+0.5932	-1.26515	-0.60408
15	-9.16095	+0.6492	-1.19427	+1.05418	2	-8.79955	+0.5976	-1.26358	-0.63981

E = - 0".03 = - 0".002

[Eph 07]

# BESSELIAN STAR-NUMBERS, 1907.

529

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Apr. 1	-8.81895	+0.5932	-1.26515	-0.60408	May 17	+8.66143	+0.6354	-1.01989	-1.23030
2	8.79955	0.5976	1.26358	0.63981	18	8.69232	0.6334	1.00882	1.23512
3	8.77342	0.6006	1.26189	0.67269	19	8.71667	0.6307	0.99734	1.23976
4	8.74304	0.6014	1.26006	0.70312	20	8.73464	0.6280	0.98543	1.24422
5	8.71155	0.6000	1.25809	0.73143	21	8.74733	0.6260	0.97306	1.24851
<sup>h</sup> (13.0) 6	-8.68323	+0.5967	-1.25599	-0.75787	<sup>h</sup> (16.0) 22	+8.75702	+0.6255	-0.96021	-1.25264
7	8.66181	0.5926	1.25375	0.78266	23	8.76678	0.6270	0.94684	1.25661
8	8.64807	0.5887	1.25137	0.80598	24	8.77952	0.6304	0.93293	1.26043
9	8.64118	0.5860	1.24885	0.82797	25	8.79775	0.6350	0.91845	1.26408
10	8.63829	0.5851	1.24618	0.84878	26	8.82230	0.6400	0.90334	1.26758
11	-8.63568	+0.5862	-1.24338	-0.86850	27	+8.85169	+0.6443	-0.88757	-1.27093
12	8.62951	0.5890	1.24043	0.88723	28	8.88315	0.6468	0.87108	1.27413
13	8.61773	0.5928	1.23733	0.90506	29	8.91350	0.6473	0.85382	1.27719
14	8.59934	0.5971	1.23409	0.92205	30	8.94022	0.6456	0.83572	1.28011
15	8.57357	0.6011	1.23069	0.93826	31	8.96175	0.6424	0.81672	1.28289
16	-8.54033	+0.6044	-1.22715	-0.95377	June 1	+8.97782	+0.6386	-0.79672	-1.28552
17	8.49982	0.6067	1.22345	0.96861	2	8.98905	0.6352	0.77563	1.28802
18	8.45286	0.6078	1.21959	0.98282	3	8.99699	0.6331	0.75334	1.29039
19	8.40071	0.6076	1.21557	0.99646	4	9.00329	0.6327	0.72972	1.29262
20	8.34596	0.6061	1.21139	1.00955	5	9.01005	0.6340	0.70462	1.29471
<sup>h</sup> (14.0) 21	-8.29314	+0.6037	-1.20705	-1.02213	<sup>h</sup> (17.0) 6	+9.01837	+0.6365	-0.67786	-1.29668
22	8.24773	0.6008	1.20253	1.03422	7	9.02902	0.6397	0.64922	1.29852
23	8.21378	0.5981	1.19785	1.04586	8	9.04183	0.6429	0.61843	1.30023
24	8.19285	0.5966	1.19299	1.05706	9	9.05652	0.6457	0.58516	1.30181
25	8.17725	0.5970	1.18795	1.06785	10	9.07218	0.6476	0.54901	1.30326
26	-8.15685	+0.5996	-1.18273	-1.07826	11	+9.08814	+0.6483	-0.50945	-1.30459
27	8.11628	0.6041	1.17732	1.08829	12	9.10377	0.6479	0.46580	1.30579
28	8.03703	0.6097	1.17172	1.09797	13	9.11833	0.6461	0.41715	1.30687
29	7.88423	0.6153	1.16592	1.10731	14	9.13127	0.6432	0.36222	1.30783
30	-7.54531	0.6198	1.15992	1.11633	15	9.14217	0.6395	0.29920	1.30866
May 1	+7.06070	+0.6223	-1.15372	-1.12504	16	+9.15070	+0.6354	-0.22535	-1.30937
2	7.76641	0.6225	1.14729	1.13345	17	9.15721	0.6318	0.13617	1.30996
3	8.00217	0.6208	1.14065	1.14158	18	9.16218	0.6295	0.02370	1.31043
4	8.12710	0.6179	1.13379	1.14943	19	9.16667	0.6289	9.87139	1.31078
5	8.19783	0.6147	1.12669	1.15702	20	9.17205	0.6302	9.63463	1.31100
<sup>h</sup> (15.0) 6	+8.23830	+0.6124	-1.11935	-1.16436	<sup>h</sup> (18.0) 21	+9.17935	+0.6330	-9.07393	-1.31111
7	8.26269	0.6116	1.11176	1.17144	22	9.18932	0.6366	+9.28783	1.31110
8	8.28285	0.6127	1.10391	1.17829	23	9.20200	0.6398	9.70456	1.31096
9	8.30750	0.6154	1.09579	1.18491	24	9.21659	0.6416	9.91316	1.31070
10	8.34084	0.6193	1.08740	1.19130	25	9.23167	0.6413	0.05338	1.31033
11	+8.38292	+0.6237	-1.07872	-1.19748	26	+9.24586	+0.6388	+0.15911	-1.30983
12	8.43152	0.6280	1.06974	1.20345	27	9.25809	0.6344	0.24397	1.30922
13	8.48259	0.6317	1.06045	1.20921	28	9.26769	0.6290	0.31482	1.30848
14	8.53339	0.6344	1.05083	1.21477	29	9.27474	0.6263	0.37562	1.30762
15	8.58092	0.6360	1.04088	1.22013	30	9.27976	0.6192	0.42884	1.30664
16	+8.62387	+0.6363	-1.03057	-1.22531	July 1	+9.28357	+0.6165	+0.47614	-1.30553
17	+8.66143	+0.6354	-1.01989	-1.23030	2	+9.28715	+0.6156	+0.51868	-1.30430

E = - 0".03 = - 0".002

# BESSELIAN STAR-NUMBERS, 1907.

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
July 1	+9.28357	+0.6165	+0.47614	-1.30553	Aug. 16	+9.50432	+0.5065	+1.17688	-1.08907
2	9.28715	0.6156	0.51868	1.30430	17	9.50928	0.5082	1.18225	1.07917
3	9.29139	0.6162	0.55731	1.30295	18	9.51509	0.5078	1.18743	1.06891
4	9.29671	0.6178	0.59268	1.30147	19	9.52120	0.5044	1.19244	1.05828
5	9.30333	0.6197	0.62528	1.29987	20	9.52686	0.4981	1.19726	1.04725
h					b				
(19.0) 6	+9.31103	+0.6212	+0.65549	-1.29814	(22.0) 21	+9.53149	+0.4895	+1.20192	-1.03580
7	9.31950	0.6218	0.68362	1.29628	22	9.53484	0.4800	1.20640	1.02391
8	9.32840	0.6214	0.70993	1.29429	23	9.53690	0.4709	1.21072	1.01155
9	9.33726	0.6197	0.73462	1.29218	24	9.53801	0.4637	1.21488	0.99870
10	9.34575	0.6165	0.75788	1.28993	25	9.53866	0.4592	1.21887	0.98533
11	+9.35342	+0.6121	+0.77983	-1.28755	26	+9.53936	+0.4574	+1.22272	-0.97139
12	9.36004	0.6066	0.80062	1.28503	27	9.54054	0.4579	1.22640	0.95686
13	9.36534	0.6007	0.82034	1.28238	28	9.54244	0.4595	1.22994	0.94169
14	9.36925	0.5949	0.83909	1.27959	29	9.54507	0.4613	1.23333	0.92584
15	9.37206	0.5901	0.85696	1.27666	30	9.54830	0.4624	1.23656	0.90925
16	+9.37429	+0.5871	+0.87400	-1.27359	Sept. 31	+9.55193	+0.4622	+1.23965	-0.89185
17	9.37669	0.5862	0.89028	1.27038	1	9.55574	0.4603	1.24260	0.87360
18	9.38008	0.5872	0.90585	1.26702	2	9.55950	0.4566	1.24541	0.85440
19	9.38505	0.5894	0.92077	1.26351	3	9.56296	0.4510	1.24808	0.83417
20	9.39182	0.5917	0.93508	1.25985	4	9.56591	0.4439	1.25061	0.81281
h					b				
(20.0) 21	+9.40009	+0.5928	+0.94882	-1.25604	(23.0) 5	+9.56823	+0.4356	+1.25300	-0.79021
22	9.40921	0.5919	0.96202	1.25208	6	9.56974	0.4270	1.25526	0.76621
23	9.41822	0.5884	0.97472	1.24795	7	9.57050	0.4193	1.25738	0.74067
24	9.42630	0.5826	0.98694	1.24367	8	9.57071	0.4136	1.25937	0.71339
25	9.43281	0.5753	0.99871	1.23922	9	9.57066	0.4109	1.26123	0.68412
26	+9.43759	+0.5675	+1.01006	-1.23460	10	+9.57089	+0.4115	+1.26295	-0.65260
27	9.44081	0.5605	1.02100	1.22980	11	9.57187	0.4149	1.26455	0.61845
28	9.44301	0.5553	1.03156	1.22483	12	9.57392	0.4196	1.26601	0.58123
29	9.44484	0.5522	1.04175	1.21968	13	9.57712	0.4240	1.26735	0.54036
30	9.44688	0.5511	1.05159	1.21434	14	9.58128	0.4264	1.26855	0.49508
31	+9.44957	+0.5515	+1.06110	-1.20881	15	+9.58586	+0.4255	+1.26963	-0.44436
Aug. 1	9.45315	0.5525	1.07029	1.20309	16	9.59030	0.4211	1.27058	0.38675
2	9.45759	0.5533	1.07918	1.19716	17	9.59401	0.4136	1.27140	0.32013
3	9.46267	0.5533	1.08777	1.19103	18	9.59670	0.4045	1.27210	0.24122
4	9.46816	0.5522	1.09607	1.18469	19	9.59830	0.3955	1.27267	0.14450
h					b				
(21.0) 5	+9.47374	+0.5495	+1.10411	-1.17812	(0.0) 20	+9.59901	+0.3883	+1.27311	-0.01964
6	9.47914	0.5453	1.11188	1.17133	21	9.59920	0.3843	1.27343	9.84339
7	9.48410	0.5396	1.11940	1.16430	22	9.59934	0.3837	1.27362	-9.54141
8	9.48833	0.5326	1.12667	1.15704	23	9.59987	0.3862	1.27368	+7.26621
9	9.49168	0.5247	1.13371	1.14952	24	9.60102	0.3905	1.27362	9.54625
10	+9.49404	+0.5168	+1.14052	-1.14174	25	+9.60286	+0.3954	+1.27343	+9.84620
11	9.49550	0.5099	1.14710	1.13370	26	9.60532	0.3998	1.27311	0.02194
12	9.49633	0.5048	1.15346	1.12538	27	9.60820	0.4028	1.27266	0.14668
13	9.49710	0.5022	1.15962	1.11677	28	9.61132	0.4039	1.27208	0.24342
14	9.49837	0.5022	1.16557	1.10785	29	9.61448	0.4030	1.27138	0.32244
15	+9.50066	+0.5040	+1.17133	-1.09862	30	+9.61746	+0.4001	+1.27055	+0.38919
16	+9.50432	+0.5065	+1.17688	-1.08907	Oct. 1	+9.62007	+0.3954	+1.26958	+0.44696

E = -0".03 = -0".002

# BESSELIAN STAR-NUMBERS, 1907.

531

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Oct. 1	+ 9.62007	+ 0.3954	+ 1.26958	+ 0.44696	Nov. 16	+ 9.71487	+ 0.4312	+ 1.04592	+ 1.21746
2	9.62216	0.3893	1.26849	0.49786	17	9.71633	0.4371	1.03532	1.22297
3	9.62362	0.3827	1.26726	0.54332	18	9.71836	0.4442	1.02431	1.22828
4	9.62443	0.3767	1.26590	0.58438	19	9.72099	0.4512	1.01287	1.23340
5	9.62474	0.3726	1.26440	0.62180	20	9.72411	0.4571	1.00098	1.23832
<sup>h</sup> (1.0) 6	+ 9.62478	+ 0.3716	+ 1.26277	+ 0.65615	<sup>h</sup> (4.0) 21	+ 9.72754	+ 0.4613	+ 0.98861	+ 1.24306
7	9.62491	0.3742	1.26101	0.68788	22	9.73109	0.4636	0.97573	1.24761
8	9.62562	0.3800	1.25910	0.71734	23	9.73456	0.4640	0.96231	1.25199
9	9.62722	0.3879	1.25706	0.74482	24	9.73780	0.4624	0.94832	1.25619
10	9.62987	0.3959	1.25487	0.77056	25	9.74070	0.4594	0.93372	1.26022
11	+ 9.63344	+ 0.4023	+ 1.25255	+ 0.79474	26	+ 9.74318	+ 0.4554	+ 0.91846	+ 1.26407
12	9.63758	0.4055	1.25008	0.81754	27	9.74517	0.4512	0.90250	1.26777
13	9.64175	0.4050	1.24746	0.83909	28	9.74671	0.4478	0.88578	1.27129
14	9.64546	0.4010	1.24469	0.85950	29	9.74792	0.4463	0.86824	1.27466
15	9.64835	0.3948	1.24178	0.87889	30	9.74906	0.4473	0.84982	1.27786
16	+ 9.65029	+ 0.3881	+ 1.23871	+ 0.89733	Dec. 1	+ 9.75043	+ 0.4511	+ 0.83043	+ 1.28091
17	9.65135	0.3828	1.23549	0.91490	2	9.75233	0.4571	0.80998	1.28380
18	9.65183	0.3804	1.23211	0.93167	3	9.75498	0.4643	0.78837	1.28654
19	9.65218	0.3815	1.22857	0.94770	4	9.75843	0.4710	0.76548	1.28913
20	9.65279	0.3859	1.22487	0.96304	5	9.76250	0.4756	0.74116	1.29157
<sup>h</sup> (2.0) 21	+ 9.65392	+ 0.3925	+ 1.22100	+ 0.97774	<sup>h</sup> (5.0) 6	+ 9.76687	+ 0.4772	+ 0.71525	+ 1.29386
22	9.65576	0.4000	1.21697	0.99184	7	9.77113	0.4754	0.68754	1.29600
23	9.65821	0.4072	1.21276	1.00538	8	9.77493	0.4707	0.65779	1.29800
24	9.66115	0.4131	1.20837	1.01838	9	9.77801	0.4644	0.62570	1.29985
25	9.66437	0.4171	1.20381	1.03089	10	9.78030	0.4579	0.59089	1.30155
26	+ 9.66766	+ 0.4191	+ 1.19906	+ 1.04293	11	+ 9.78195	+ 0.4530	+ 0.55289	+ 1.30312
27	9.67083	0.4191	1.19412	1.05452	12	9.78322	0.4506	0.51108	1.30454
28	9.67374	0.4172	1.18899	1.06569	13	9.78446	0.4512	0.46467	1.30582
29	9.67622	0.4139	1.18366	1.07646	14	9.78596	0.4543	0.41253	1.30696
30	9.67820	0.4098	1.17812	1.08684	15	9.78789	0.4588	0.35310	1.30796
31	+ 9.67962	+ 0.4059	+ 1.17238	+ 1.09686	16	+ 9.79034	+ 0.4637	+ 0.28405	+ 1.30883
Nov. 1	9.68055	0.4033	1.16642	1.10653	17	9.79325	0.4677	0.20174	1.30955
2	9.68120	0.4033	1.16024	1.11586	18	9.79645	0.4703	0.09990	1.31014
3	9.68188	0.4064	1.15384	1.12487	19	9.79978	0.4709	0.96641	1.31059
4	9.68295	0.4126	1.14720	1.13358	20	9.80308	0.4695	9.77244	1.31090
<sup>h</sup> (3.0) 5	+ 9.68476	+ 0.4210	+ 1.14032	+ 1.14198	<sup>h</sup> (6.0) 21	+ 9.80622	+ 0.4662	+ 9.41250	+ 1.31108
6	9.68746	0.4300	1.13318	1.15010	22	9.80907	0.4611	- 8.87655	1.31112
7	9.69104	0.4379	1.12579	1.15794	23	9.81154	0.4548	9.61179	1.31102
8	9.69525	0.4432	1.11814	1.16552	24	9.81357	0.4480	9.87087	1.31078
9	9.69967	0.4450	1.11020	1.17284	25	9.81519	0.4416	0.03195	1.31040
10	+ 9.70381	+ 0.4435	+ 1.10198	+ 1.17990	26	+ 9.81646	+ 0.4366	- 0.14909	+ 1.30989
11	9.70730	0.4394	1.09346	1.18673	27	9.81757	0.4339	0.24116	1.30924
12	9.70994	0.4341	1.08463	1.19332	28	9.81876	0.4341	0.31698	1.30845
13	9.71174	0.4295	1.07548	1.19968	29	9.82030	0.4369	0.38140	1.30752
14	9.71293	0.4270	1.06598	1.20582	30	9.82243	0.4414	0.43737	1.30645
15	+ 9.71383	+ 0.4276	+ 1.05614	+ 1.21175	31	+ 9.82522	+ 0.4459	- 0.48682	+ 1.30525
16	+ 9.71487	+ 0.4312	+ 1.04592	+ 1.21746	32	+ 9.82863	+ 0.4489	- 0.53110	+ 1.30389

E = - 0".04 = - 0".003

[Eph 07]

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$	$f'$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .	
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.					
		y	s	s	° ' "	h m	° ' "			"		
Jan.	0	-0.0008	-0.864	+0.005	134 32.5	8 58.1	351 7.9	23 24.5	+0.90123	+1.31015	-1.37	-0.1354
	1	+0.0019	0.853	0.007	134 18.2	8 57.2	350 11.5	23 20.8	0.89643	1.30994	1.51	0.1786
	2	0.0047	0.842	0.008	134 10.0	8 56.7	349 15.1	23 17.0	0.89165	1.30970	1.65	0.2177
	3	0.0074	0.832	0.006	134 7.4	8 56.5	348 18.6	23 13.2	0.88725	1.30945	1.79	0.2534
h (7.0)	4	0.0101	0.821	+0.003	134 8.0	8 56.5	347 22.0	23 9.5	0.88358	1.30917	1.93	0.2863
	5	0.0129	-0.811	-0.002	134 8.1	8 56.5	346 25.3	23 5.7	+0.88082	+1.30888	-2.07	-0.3168
	6	0.0156	0.801	0.008	134 3.6	8 56.2	345 28.6	23 1.9	0.87890	1.30856	2.21	0.3451
	7	0.0184	0.790	0.013	133 51.2	8 55.4	344 31.8	22 58.1	0.87756	1.30823	2.35	0.3716
	8	0.0211	0.780	0.015	133 29.0	8 53.9	343 34.9	22 54.3	0.87627	1.30788	2.49	0.3964
	9	0.0238	0.770	0.015	132 57.9	8 51.9	342 37.9	22 50.5	0.87447	1.30751	2.63	0.4197
	10	0.0266	-0.760	-0.011	132 21.2	8 49.4	341 40.8	22 46.7	+0.87173	+1.30712	-2.77	-0.4418
	11	0.0293	0.750	-0.005	131 43.2	8 46.9	340 43.6	22 42.9	0.86778	1.30671	2.90	0.4626
	12	0.0320	0.740	+0.002	131 8.5	8 44.6	339 46.3	22 39.1	0.86268	1.30629	3.04	0.4823
	13	0.0348	0.729	0.009	130 41.2	8 42.7	338 48.9	22 35.3	0.85676	1.30585	3.17	0.5011
	14	0.0375	0.719	0.013	130 23.2	8 41.6	337 51.3	22 31.4	0.85052	1.30539	3.30	0.5189
	15	0.0403	-0.709	+0.015	130 14.2	8 40.9	336 53.7	22 27.6	+0.84456	+1.30492	-3.43	-0.5359
	16	0.0430	0.700	0.014	130 11.9	8 40.8	335 55.9	22 23.7	0.83941	1.30443	3.56	0.5522
	17	0.0457	0.690	0.010	130 12.6	8 40.8	334 58.0	22 19.9	0.83533	1.30392	3.69	0.5677
	18	0.0485	0.681	0.006	130 11.9	8 40.8	334 0.0	22 16.0	0.83233	1.30341	3.82	0.5825
h (8.0)	19	0.0512	0.671	+0.001	130 6.8	8 40.5	333 1.9	22 12.1	0.83014	1.30287	3.95	0.5967
	20	0.0540	-0.662	-0.003	129 55.8	8 39.7	332 3.7	22 8.2	+0.82842	+1.30233	-4.08	-0.6103
	21	0.0567	0.652	0.006	129 38.8	8 38.6	331 5.3	22 4.4	0.82680	1.30177	4.20	0.6234
	22	0.0594	0.643	0.008	129 16.4	8 37.1	330 6.7	22 0.4	0.82494	1.30120	4.33	0.6360
	23	0.0622	0.634	0.007	128 50.2	8 35.3	329 8.0	21 56.5	0.82261	1.30062	4.45	0.6480
	24	0.0649	0.625	0.006	128 21.8	8 33.5	328 9.2	21 52.6	0.81960	1.30003	4.57	0.6596
	25	0.0676	-0.616	-0.003	127 53.2	8 31.5	327 10.3	21 48.7	+0.81589	+1.29943	-4.69	-0.6708
	26	0.0704	0.607	+0.001	127 26.4	8 29.8	326 11.2	21 44.7	0.81143	1.29882	4.80	0.6816
	27	0.0731	0.598	0.004	127 3.6	8 28.2	325 11.9	21 40.8	0.80626	1.29820	4.92	0.6919
	28	0.0758	0.589	0.007	126 46.7	8 27.1	324 12.5	21 36.9	0.80057	1.29757	5.03	0.7019
	29	0.0786	0.581	0.008	126 37.0	8 26.5	323 12.9	21 32.9	0.79464	1.29694	5.15	0.7115
	30	0.0813	-0.572	+0.008	126 35.1	8 26.3	322 13.2	21 28.9	+0.78893	+1.29630	-5.26	-0.7208
	31	0.0841	0.564	+0.005	126 39.2	8 26.6	321 13.3	21 24.9	0.78392	1.29566	5.37	0.7297
Feb.	1	0.0868	0.555	0.000	126 45.9	8 27.1	320 13.3	21 20.9	0.78004	1.29501	5.48	0.7383
	2	0.0895	0.547	-0.006	126 49.7	8 27.3	319 13.0	21 16.9	0.77740	1.29435	5.58	0.7468
h (9.0)	3	0.0923	0.539	0.011	126 45.9	8 27.1	318 12.6	21 12.8	0.77584	1.29369	5.68	0.7547
	4	0.0950	-0.531	-0.014	126 31.2	8 26.1	317 12.1	21 8.8	+0.77485	+1.29303	-5.79	-0.7624
	5	0.0978	0.523	0.015	126 4.7	8 24.3	316 11.4	21 4.8	0.77372	1.29237	5.89	0.7699
	6	0.1005	0.515	0.013	125 28.6	8 21.9	315 10.5	21 0.7	0.77174	1.29171	5.99	0.7771
	7	0.1032	0.507	0.008	124 47.0	8 19.1	314 9.4	20 56.6	0.76844	1.29104	6.08	0.7841
	8	0.1060	0.500	-0.001	124 6.1	8 16.4	313 8.2	20 52.5	0.76361	1.29038	6.18	0.7908
	9	0.1087	-0.492	+0.006	123 31.5	8 14.1	312 6.8	20 48.4	+0.75747	+1.28972	-6.27	-0.7973
	10	0.1114	0.485	0.011	123 7.1	8 12.5	311 5.2	20 44.3	0.75052	1.28907	6.36	0.8035
	11	0.1142	0.477	0.014	122 54.7	8 11.6	310 3.5	20 40.2	0.74349	1.28841	6.45	0.8096
	12	0.1169	0.470	0.014	122 52.7	8 11.5	309 1.6	20 36.1	0.73716	1.28776	6.54	0.8154
	13	0.1197	0.463	0.011	122 57.0	8 11.8	307 59.5	20 32.0	0.73203	1.28712	6.62	0.8210
	14	0.1224	-0.456	+0.007	123 2.5	8 12.2	306 57.3	20 27.8	+0.72832	+1.28648	-6.70	-0.8264
	15	0.1251	-0.449	+0.002	123 4.7	8 12.3	305 54.9	20 23.7	+0.72595	+1.28585	-6.78	-0.8315

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Time.	In Time.	In Arc.	In Arc.	In Time.	In Time.				
	$y$	$a$	$s$	$h$	$m$	$^{\circ}$	$'$	$h$	$m$				
Feb. 15	0.1251	-0.449	+0.002	123	4.7	8	12.3	305	54.9	+0.72595	+1.28585	-6.78	-0.8315
16	0.1279	0.442	-0.003	123	0.1	8	12.0	304	52.4	0.72451	1.28522	6.86	0.8365
17	0.1306	0.435	0.006	122	47.5	8	11.2	303	49.7	0.72349	1.28461	6.94	0.8413
18	0.1334	0.429	0.008	122	27.3	8	9.8	302	46.9	0.72241	1.28400	7.01	0.8459
h 19	0.1361	0.422	0.008	122	1.2	8	8.1	301	43.9	0.72094	1.28341	7.08	0.8504
(10.0) 20	0.1388	-0.416	-0.006	121	31.3	8	6.1	300	40.9	+0.71880	+1.28282	-7.15	-0.8546
21	0.1416	0.409	-0.003	120	59.6	8	4.0	299	37.6	0.71585	1.28225	7.22	0.8587
22	0.1443	0.403	0.000	120	28.5	8	1.9	298	34.3	0.71200	1.28169	7.29	0.8626
23	0.1470	0.396	+0.003	120	0.4	8	0.0	297	30.8	0.70722	1.28115	7.35	0.8663
24	0.1498	0.390	0.007	119	37.8	7	58.5	296	27.2	0.70164	1.28061	7.41	0.8699
25	0.1525	-0.384	+0.009	119	23.1	7	57.5	295	23.4	+0.69555	+1.28010	-7.47	-0.8733
26	0.1552	0.378	0.009	119	17.9	7	57.2	294	19.6	0.68942	1.27960	7.53	0.8765
27	0.1580	0.372	0.007	119	21.6	7	57.4	293	15.6	0.68389	1.27911	7.58	0.8796
28	0.1607	0.366	+0.003	119	30.8	7	58.1	292	11.5	0.67956	1.27864	7.63	0.8825
Mar. 1	0.1635	0.360	-0.003	119	40.3	7	58.7	291	7.4	0.67685	1.27819	7.68	0.8853
2	0.1662	-0.354	-0.008	119	43.3	7	58.9	290	3.1	+0.67578	+1.27776	-7.72	-0.8879
3	0.1689	0.348	0.012	119	34.7	7	58.3	288	58.7	0.67590	1.27735	7.77	0.8903
4	0.1717	0.342	0.015	119	11.2	7	56.7	287	54.2	0.67645	1.27695	7.81	0.8927
5	0.1744	0.337	0.013	118	33.6	7	54.2	286	49.7	0.67651	1.27658	7.85	0.8948
h 6	0.1772	0.331	0.009	117	46.3	7	51.1	285	45.0	0.67528	1.27623	7.89	0.8969
(11.0) 7	0.1799	-0.326	-0.003	116	55.4	7	47.7	284	40.3	+0.67230	+1.27590	-7.92	-0.8988
8	0.1826	0.320	+0.004	116	8.2	7	44.5	283	35.6	0.66755	1.27559	7.95	0.9005
9	0.1854	0.315	0.009	115	30.8	7	42.1	282	30.7	0.66140	1.27530	7.98	0.9021
10	0.1881	0.309	0.013	115	7.2	7	40.5	281	25.8	0.65468	1.27503	8.01	0.9036
11	0.1908	0.304	0.014	114	57.4	7	39.8	280	20.9	0.64825	1.27479	8.03	0.9049
12	0.1936	-0.298	+0.012	114	58.0	7	39.9	279	15.9	+0.64302	+1.27457	-8.06	-0.9061
13	0.1963	0.293	0.008	115	3.9	7	40.3	278	10.9	0.63948	1.27438	8.08	0.9072
14	0.1991	0.288	+0.003	115	8.2	7	40.5	277	5.9	0.63772	1.27421	8.09	0.9081
15	0.2018	0.282	-0.002	115	5.8	7	40.4	276	0.9	0.63742	1.27406	8.11	0.9089
16	0.2045	0.277	0.006	114	54.0	7	39.6	274	55.9	0.63803	1.27393	8.12	0.9096
17	0.2073	-0.272	-0.008	114	32.2	7	38.1	273	50.9	+0.63894	+1.27383	-8.13	-0.9101
18	0.2100	0.266	0.008	114	1.8	7	36.1	272	45.9	0.63960	1.27376	8.14	0.9105
19	0.2128	0.261	0.007	113	25.2	7	33.7	271	40.9	0.63968	1.27371	8.14	0.9108
20	0.2155	0.256	0.005	112	44.7	7	31.0	270	35.9	0.63889	1.27368	8.15	0.9109
h 21	0.2182	0.251	-0.001	112	2.8	7	28.2	269	31.0	0.63708	1.27368	8.15	0.9109
(12.0) 22	0.2210	-0.245	+0.003	111	22.4	7	25.5	268	26.1	+0.63420	+1.27370	-8.14	-0.9108
23	0.2237	0.240	0.006	110	46.3	7	23.1	267	21.3	0.63029	1.27375	8.14	0.9106
24	0.2264	0.235	0.008	110	17.5	7	21.2	266	16.5	0.62554	1.27382	8.13	0.9102
25	0.2292	0.229	0.008	109	58.3	7	19.9	265	11.8	0.62038	1.27392	8.12	0.9097
26	0.2319	0.224	0.007	109	49.3	7	19.3	264	7.2	0.61549	1.27404	8.11	0.9090
27	0.2346	-0.219	+0.004	109	48.9	7	19.3	263	2.7	+0.61158	+1.27418	-8.10	-0.9082
28	0.2374	0.213	-0.001	109	52.5	7	19.5	261	58.2	0.60937	1.27435	8.08	0.9073
29	0.2401	0.208	0.006	109	53.0	7	19.5	260	53.9	0.60916	1.27454	8.06	0.9063
30	0.2429	0.203	0.011	109	43.8	7	18.9	259	49.6	0.61083	1.27476	8.04	0.9051
31	0.2456	0.197	0.014	109	19.4	7	17.3	258	45.4	0.61363	1.27499	8.01	0.9038
Apr. 1	0.2483	-0.192	-0.013	108	37.8	7	14.5	257	41.3	+0.61659	+1.27525	-7.99	-0.9024
2	0.2511	-0.186	-0.010	107	41.9	7	10.8	256	37.4	+0.61870	+1.27553	-7.96	-0.9008

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	y	s	s	°	h m	°	h m	°	h m			"	
Apr.	1	0.2483	-0.192	-0.013	108 37.8	7 14.5	257 41.3	17 10.8	+0.61659	+1.27525	-7.99	-0.9024	
	2	0.2511	0.186	0.010	107 41.9	7 10.8	256 37.4	17 6.5	0.61870	1.27553	7.96	0.9008	
	3	0.2538	0.181	-0.004	106 37.0	7 6.5	255 33.6	17 2.2	0.61914	1.27583	7.93	0.8992	
	4	0.2566	0.175	+0.002	105 31.2	7 2.1	254 29.9	16 58.0	0.61756	1.27615	7.90	0.8973	
	h	5	0.2593	0.169	0.008	104 31.8	6 58.1	253 26.3	16 53.8	0.61408	1.27649	7.86	0.8954
	(13.0)	6	0.2620	-0.164	+0.013	103 44.9	6 55.0	252 22.8	16 49.5	+0.60934	+1.27685	-7.82	-0.8933
	7	0.2648	0.158	0.014	103 13.8	6 52.9	251 19.5	16 45.3	0.60427	1.27723	7.78	0.8910	
	8	0.2675	0.152	0.013	102 56.7	6 51.8	250 16.3	16 41.1	0.59983	1.27763	7.74	0.8886	
	9	0.2702	0.146	0.009	102 49.4	6 51.3	249 13.3	16 36.9	0.59692	1.27805	7.69	0.8861	
	10	0.2730	0.140	+0.004	102 46.0	6 51.1	248 10.5	16 32.7	0.59598	1.27849	7.65	0.8834	
	11	0.2757	-0.134	-0.001	102 39.6	6 50.6	247 7.8	16 28.5	+0.59694	+1.27894	-7.60	-0.8806	
	12	0.2785	0.128	0.005	102 24.6	6 49.6	246 5.2	16 24.3	0.59930	1.27941	7.55	0.8777	
	13	0.2812	0.122	0.008	101 59.1	6 47.9	245 2.9	16 20.2	0.60242	1.27989	7.49	0.8746	
	14	0.2839	0.116	0.009	101 23.6	6 45.6	244 0.7	16 16.0	0.60571	1.28039	7.44	0.8714	
	15	0.2867	0.110	0.008	100 39.4	6 42.6	242 58.7	16 11.9	0.60862	1.28090	7.38	0.8680	
	16	0.2894	-0.103	-0.006	99 48.8	6 39.3	241 56.9	16 7.8	+0.61080	+1.28142	-7.32	-0.8644	
	17	0.2922	0.097	-0.002	98 54.4	6 35.6	240 55.3	16 3.7	0.61198	1.28196	7.26	0.8607	
	18	0.2949	0.091	+0.001	97 59.2	6 31.9	239 53.8	15 59.6	0.61208	1.28251	7.19	0.8569	
	19	0.2976	0.084	0.004	97 5.7	6 28.4	238 52.6	15 55.5	0.61098	1.28307	7.13	0.8528	
	h	20	0.3004	0.078	0.007	96 17.0	6 25.1	237 51.6	0.60878	1.28364	7.06	0.8487	
	(14.0)	21	0.3031	-0.071	+0.008	95 36.0	6 22.4	236 50.7	0.60578	+1.28422	-6.99	-0.8443	
	22	0.3058	0.064	0.007	95 4.9	6 20.3	235 50.1	15 43.3	0.60248	1.28481	6.92	0.8398	
	23	0.3086	0.057	+0.004	94 44.0	6 18.9	234 49.7	15 39.3	0.59960	1.28540	6.84	0.8351	
	24	0.3113	0.050	0.000	94 31.4	6 18.1	233 49.6	15 35.3	0.59799	1.28600	6.76	0.8303	
	25	0.3140	0.043	-0.005	94 21.7	6 17.4	232 49.6	15 31.3	0.59826	1.28661	6.69	0.8252	
	26	0.3168	-0.036	-0.010	94 8.2	6 16.5	231 49.6	15 27.3	+0.60072	+1.28723	-6.61	-0.8200	
	27	0.3195	0.029	0.013	93 43.8	6 14.9	230 49.9	15 23.3	0.60501	1.28785	6.53	0.8146	
	28	0.3223	0.022	0.014	93 4.2	6 12.3	229 50.5	15 19.4	0.61030	1.28847	6.44	0.8090	
	29	0.3250	0.015	0.011	92 7.9	6 8.5	228 51.3	15 15.4	0.61560	1.28910	6.36	0.8032	
	30	0.3277	-0.007	-0.006	90 58.0	6 3.9	227 52.2	15 11.5	0.61981	1.28973	6.27	0.7972	
May	1	0.3305	0.000	+0.001	89 41.1	5 58.7	226 53.4	15 7.6	+0.62228	+1.29037	-6.18	-0.7910	
	2	0.3332	+0.008	0.007	88 24.0	5 53.6	225 54.8	15 3.7	0.62272	1.29100	6.09	0.7846	
	3	0.3360	0.015	0.012	87 14.3	5 49.0	224 56.3	14 59.8	0.62132	1.29163	6.00	0.7779	
	4	0.3387	0.023	0.014	86 17.7	5 45.2	223 58.1	14 55.9	0.61878	1.29227	5.90	0.7711	
	h	5	0.3414	0.031	0.014	85 36.6	5 42.4	223 0.0	0.61596	1.29290	5.81	0.7640	
	(15.0)	6	0.3442	+0.039	+0.011	85 9.5	5 40.6	222 2.2	0.61393	+1.29353	-5.71	-0.7566	
	7	0.3469	0.047	0.007	84 52.2	5 39.5	221 4.5	14 44.3	0.61335	1.29416	5.61	0.7490	
	8	0.3496	0.055	+0.001	84 38.5	5 38.6	220 7.0	14 40.5	0.61457	1.29478	5.51	0.7411	
	9	0.3524	0.063	-0.004	84 22.0	5 37.5	219 9.7	14 36.6	0.61752	1.29541	5.41	0.7331	
	10	0.3551	0.072	0.007	83 58.5	5 35.9	218 12.6	14 32.8	0.62172	1.29602	5.31	0.7247	
	11	0.3579	+0.080	-0.008	83 25.9	5 33.7	217 15.7	14 29.0	+0.62660	+1.29663	-5.20	-0.7160	
	12	0.3606	0.089	0.008	82 44.0	5 30.9	216 19.0	14 25.3	0.63149	1.29724	5.09	0.7070	
	13	0.3633	0.097	0.006	81 54.3	5 27.6	215 22.4	14 21.5	0.63602	1.29784	4.99	0.6977	
	14	0.3661	0.106	-0.003	80 58.5	5 23.9	214 26.0	14 17.7	0.63983	1.29843	4.88	0.6881	
	15	0.3688	0.114	0.000	79 59.2	5 19.9	213 29.8	14 14.0	0.64267	1.29902	4.77	0.6781	
	16	0.3715	+0.123	+0.003	78 58.6	5 15.9	212 33.8	14 10.3	+0.64441	+1.29959	-4.65	-0.6678	
	17	0.3743	+0.132	+0.006	77 59.1	5 11.9	211 38.0	14 6.5	+0.64500	+1.30016	-4.54	-0.6572	



(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f'$		$f''$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	y	s	s	°	h m	°	h m					"	
May	17	0.3743	+0.132	+0.006	77 59.1	5 11.9	211 38.0	14 6.5	+0.64500	+1.30016	-4.54	-0.6572	
"	18	0.3770	0.141	0.008	77 41.1	5 8.3	210 42.3	14 2.8	0.64451	1.30072	4.43	0.6461	
"	19	0.3798	0.150	0.007	76 16.1	5 5.1	209 46.8	13 59.1	0.64326	1.30127	4.31	0.6346	
"	20	0.3825	0.159	0.005	75 37.5	5 2.5	208 51.5	13 55.4	0.64176	1.30180	4.20	0.6227	
h	21	0.3852	0.168	+0.001	75 9.2	5 0.6	207 56.3	13 51.8	0.64073	1.30233	4.08	0.6103	
(16.0)	22	0.3880	+0.177	-0.004	74 49.1	4 59.3	207 1.3	13 48.1	+0.64097	+1.30284	-3.96	-0.5975	
"	23	0.3907	0.187	0.010	74 32.4	4 58.2	206 6.4	13 44.4	0.64300	1.30335	3.84	0.5841	
"	24	0.3934	0.196	0.014	74 13.1	4 56.9	205 11.7	13 40.8	0.64704	1.30384	3.72	0.5702	
"	25	0.3962	0.206	0.015	73 44.6	4 55.0	204 17.1	13 37.1	0.65272	1.30431	3.60	0.5557	
"	26	0.3989	0.215	0.013	73 2.3	4 52.2	203 22.7	13 33.5	0.65934	1.30478	3.47	0.5406	
"	27	0.4017	+0.225	-0.009	72 5.3	4 48.4	202 28.4	13 29.9	+0.66585	+1.30523	-3.35	-0.5248	
"	28	0.4044	0.234	-0.002	70 56.6	4 43.8	201 34.2	13 26.3	0.67131	1.30567	3.22	0.5083	
"	29	0.4071	0.244	+0.005	69 41.6	4 38.8	200 40.1	13 22.7	0.67514	1.30609	3.10	0.4911	
"	30	0.4099	0.254	0.011	68 26.7	4 33.8	199 46.2	13 19.1	0.67711	1.30650	2.97	0.4730	
"	31	0.4126	0.263	0.015	67 18.4	4 29.2	198 52.4	13 15.5	0.67743	1.30688	2.84	0.4540	
June	1	0.4154	+0.273	+0.016	66 21.5	4 25.4	197 58.6	13 11.9	+0.67670	+1.30726	-2.72	-0.4340	
"	2	0.4181	0.283	0.013	65 38.6	4 22.6	197 5.0	13 8.3	0.67573	1.30762	2.59	0.4129	
"	3	0.4208	0.293	0.009	65 8.5	4 20.6	196 11.5	13 4.8	0.67534	1.30796	2.46	0.3906	
"	4	0.4236	0.303	+0.004	64 48.0	4 19.2	195 18.1	13 1.2	0.67613	1.30829	2.33	0.3670	
h	5	0.4263	0.313	-0.002	64 31.2	4 18.1	194 24.7	12 57.6	0.67840	1.30860	2.20	0.3419	
(17.0)	6	0.4290	+0.323	-0.006	64 13.1	4 16.9	193 31.5	12 54.1	+0.68203	+1.30889	-2.07	-0.3151	
"	7	0.4318	0.334	0.008	63 50.0	4 15.3	192 38.3	12 50.6	0.68664	1.30917	1.93	0.2865	
"	8	0.4345	0.344	0.008	63 19.7	4 13.3	191 45.2	12 47.0	0.69178	1.30943	1.80	0.2558	
"	9	0.4372	0.354	0.007	62 41.7	4 10.8	190 52.2	12 43.5	0.69698	1.30967	1.67	0.2224	
"	10	0.4400	0.364	0.004	61 56.9	4 7.8	189 59.2	12 39.9	0.70186	1.30989	1.54	0.1863	
"	11	0.4427	+0.374	-0.001	61 6.4	4 4.4	189 6.3	12 36.4	+0.70607	+1.31010	-1.40	-0.1467	
"	12	0.4455	0.385	+0.003	60 12.0	4 0.8	188 13.5	12 32.9	0.70947	1.31028	1.27	0.1031	
"	13	0.4482	0.395	0.006	59 15.8	3 57.1	187 20.7	12 29.4	0.71185	1.31045	1.13	0.0544	
"	14	0.4509	0.405	0.008	58 20.2	3 53.3	186 27.9	12 25.9	0.71320	1.31060	1.00	0.9995	
"	15	0.4537	0.416	0.008	57 28.1	3 49.9	185 35.3	12 22.4	0.71360	1.31073	0.86	0.9365	
"	16	0.4564	+0.426	+0.006	56 42.7	3 46.8	184 42.7	12 18.8	+0.71327	+1.31084	-0.73	-0.8626	
"	17	0.4592	0.436	+0.002	56 6.0	3 44.4	183 50.1	12 15.3	0.71277	1.31093	0.59	0.7734	
"	18	0.4619	0.447	-0.003	55 39.0	3 42.6	182 57.5	12 11.8	0.71270	1.31101	0.46	0.6610	
"	19	0.4646	0.457	0.009	55 20.0	3 41.3	182 4.9	12 8.3	0.71375	1.31106	0.32	0.5087	
h	20	0.4674	0.468	0.014	55 4.9	3 40.3	181 12.4	12 4.8	0.71638	1.31110	0.19	0.2719	
(18.0)	21	0.4701	+0.478	-0.016	54 48.4	3 39.2	180 19.9	12 1.3	+0.72071	+1.31112	-0.05	-0.7112	
"	22	0.4728	0.489	0.016	54 24.4	3 37.6	179 27.4	11 57.8	0.72642	1.31111	+0.08	+0.8251	
"	23	0.4756	0.499	0.012	53 48.6	3 35.2	178 34.9	11 54.3	0.73288	1.31109	0.22	0.9348	
"	24	0.4783	0.509	-0.006	53 0.1	3 32.0	177 42.4	11 50.8	0.73919	1.31105	0.35	0.9504	
"	25	0.4811	0.520	+0.002	52 1.5	3 28.1	176 49.9	11 47.3	0.74460	1.31099	0.49	0.9697	
"	26	0.4838	+0.530	+0.009	50 57.1	3 23.8	175 57.4	11 43.8	+0.74856	+1.31092	+0.63	+0.7964	
"	27	0.4865	0.541	0.014	49 52.5	3 19.5	175 4.9	11 40.3	0.75092	1.31082	0.76	0.8812	
"	28	0.4893	0.551	0.016	48 53.8	3 15.6	174 12.4	11 36.8	0.75188	1.31070	0.90	0.9521	
"	29	0.4920	0.561	0.015	48 5.0	3 12.3	173 19.8	11 33.3	0.75196	1.31057	1.03	0.0129	
"	30	0.4948	0.572	0.011	47 28.0	3 9.9	172 27.1	11 29.8	0.75183	1.31041	1.16	0.0661	
July	1	0.4975	+0.582	+0.006	47 2.2	3 8.1	171 34.5	11 26.3	+0.75213	+1.31024	+1.30	+0.1134	
"	2	0.5002	+0.592	+0.001	46 44.5	3 7.0	170 41.8	11 22.8	+0.75331	+1.31005	+1.43	+0.1560	

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$	$f'$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .	
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.					
July	1	0.4975	+0.582	+0.006	47 2.2	3 8.1	171 34.5	11 26.3	+0.75213	+1.31024	+1.30	+0.1134
	2	0.5002	0.592	+0.001	46 44.5	3 7.0	170 41.8	11 22.8	0.75331	1.31005	1.43	0.1560
	3	0.5030	0.602	-0.004	46 30.2	3 6.0	169 49.0	11 19.3	0.75565	1.30984	1.57	0.1946
	4	0.5057	0.612	0.006	46 15.4	3 5.0	168 56.2	11 15.7	0.75899	1.30962	1.70	0.2300
	5	0.5084	0.623	0.007	45 56.6	3 3.8	168 3.3	11 12.2	0.76315	1.30938	1.83	0.2626
	h	0.5112	+0.633	-0.006	45 32.1	3 2.1	167 10.4	11 8.7	+0.76767	+1.30911	+1.96	+0.2928
	(19.0)	0.5139	0.643	0.004	45 1.3	3 0.1	166 17.4	11 5.2	0.77220	1.30884	2.09	0.3209
	7	0.5166	0.653	-0.001	44 24.4	2 57.6	165 24.3	11 1.6	0.77648	1.30854	2.22	0.3472
	8	0.5194	0.663	+0.003	43 42.3	2 54.8	164 31.1	10 58.1	0.78022	1.30823	2.35	0.3719
	9	0.5221	0.673	0.006	42 56.4	2 51.8	163 37.8	10 54.5	0.78323	1.30790	2.48	0.3952
	10	0.5249	+0.683	+0.008	42 8.7	2 48.6	162 44.5	10 51.0	+0.78538	+1.30755	+2.61	+0.4171
	11	0.5276	0.693	0.009	41 21.2	2 45.4	161 51.1	10 47.4	0.78663	1.30719	2.74	0.4379
	12	0.5303	0.703	0.008	40 37.0	2 42.5	160 57.6	10 43.8	0.78707	1.30681	2.87	0.4576
	13	0.5331	0.712	+0.004	39 59.2	2 39.9	160 4.0	10 40.3	0.78692	1.30642	3.00	0.4764
	14	0.5358	0.722	-0.001	39 29.7	2 38.0	159 10.2	10 36.7	0.78665	1.30601	3.12	0.4942
	15	0.5386	+0.732	-0.007	39 9.3	2 36.6	158 16.4	10 33.1	+0.78677	+1.30559	+3.24	+0.5113
	16	0.5413	0.741	0.012	38 56.4	2 35.8	157 22.5	10 29.5	0.78785	1.30515	3.37	0.5276
	17	0.5440	0.751	0.016	38 47.3	2 35.2	156 28.5	10 25.9	0.79031	1.30470	3.49	0.5431
	18	0.5468	0.760	0.017	38 36.7	2 34.4	155 34.3	10 22.3	0.79421	1.30424	3.61	0.5580
	19	0.5495	0.770	0.015	38 19.4	2 33.3	154 40.0	10 18.7	0.79924	1.30376	3.74	0.5723
h	20	0.5522	+0.779	-0.009	37 51.9	2 31.5	153 45.6	10 15.0	+0.80479	+1.30327	+3.86	+0.5861
	(20.0)	0.5550	0.788	-0.002	37 13.4	2 28.9	152 51.1	10 11.4	0.81017	1.30277	3.97	0.5993
	22	0.5577	0.798	+0.005	36 26.0	2 25.7	151 56.4	10 7.8	0.81470	1.30226	4.09	0.6120
	23	0.5605	0.807	0.011	35 33.8	2 22.3	151 1.6	10 4.1	0.81798	1.30174	4.21	0.6242
	24	0.5632	0.816	0.014	34 42.2	2 18.8	150 6.7	10 0.4	0.81991	1.30120	4.33	0.6360
	25	0.5659	+0.825	+0.015	33 56.0	2 15.7	149 11.6	9 56.8	+0.82071	+1.30066	+4.44	+0.6473
	26	0.5687	0.834	0.012	33 18.8	2 13.3	148 16.3	9 53.1	0.82080	1.30010	4.55	0.6583
	27	0.5714	0.842	0.007	32 51.9	2 11.5	147 20.9	9 49.4	0.82078	1.29954	4.66	0.6688
	28	0.5742	0.851	+0.002	32 34.2	2 10.3	146 25.3	9 45.7	0.82118	1.29897	4.78	0.6790
	29	0.5769	0.860	-0.002	32 23.0	2 9.5	145 29.6	9 42.0	0.82232	1.29839	4.88	0.6889
	30	0.5796	+0.868	-0.006	32 14.6	2 9.0	144 33.7	9 38.2	+0.82434	+1.29780	+4.99	+0.6984
Aug.	1	0.5824	0.877	0.007	32 5.4	2 8.4	143 37.6	9 34.5	0.82718	1.29720	5.10	0.7076
	2	0.5851	0.885	0.006	31 52.4	2 7.5	142 41.3	9 30.8	0.83060	1.29660	5.20	0.7164
	3	0.5878	0.894	0.004	31 34.6	2 6.3	141 44.9	9 27.0	0.83429	1.29600	5.31	0.7250
	4	0.5906	0.902	-0.001	31 11.2	2 4.7	140 48.3	9 23.2	0.83798	1.29538	5.41	0.7333
	h	0.5933	+0.910	+0.003	30 42.5	2 2.8	139 51.5	9 19.4	+0.84139	+1.29477	+5.51	+0.7414
	(21.0)	0.5960	0.918	0.006	30 9.4	2 0.6	138 54.5	9 15.6	0.84433	1.29415	5.61	0.7492
	6	0.5988	0.926	0.008	29 32.9	1 58.2	137 57.4	9 11.8	0.84664	1.29353	5.71	0.7567
	7	0.6015	0.934	0.009	28 54.9	1 55.7	137 0.1	9 8.0	0.84817	1.29290	5.81	0.7639
h	8	0.6043	0.942	0.009	28 17.6	1 53.2	136 2.6	9 4.2	0.84896	1.29227	5.90	0.7710
	9	0.6070	+0.950	+0.006	27 44.0	1 50.9	135 4.9	9 0.3	+0.84907	+1.29165	+6.00	+0.7778
	10	0.6097	0.957	+0.002	27 16.6	1 49.1	134 7.0	8 56.5	0.84873	1.29102	6.09	0.7844
	11	0.6125	0.965	-0.004	26 57.5	1 47.8	133 8.9	8 52.6	0.84832	1.29039	6.18	0.7907
	12	0.6152	0.973	0.010	26 46.9	1 47.1	132 10.7	8 48.7	0.84841	1.28976	6.26	0.7969
	13	0.6180	0.980	0.014	26 42.6	1 46.8	131 12.2	8 44.8	0.84941	1.28914	6.35	0.8028
	14	0.6207	+0.988	-0.017	26 41.4	1 46.8	130 13.6	8 40.9	+0.85162	+1.28852	+6.44	+0.8086
	15	0.6234	+0.995	-0.016	26 37.7	1 46.5	129 14.8	8 37.0	+0.85504	+1.28790	+6.52	+0.8142

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f'$		$f''$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
		$\gamma$	$\delta$	$\epsilon$	$\zeta$	$\eta$	$\theta$	$\iota$	$\kappa$				
Aug.	16	0.6234	+0.995	-0.016	26 37.7	1 46.5	129 14.8	8 37.0	+0.85504	+1.28790	+6.52	+0.8142	
	17	0.6262	1.002	0.012	26 27.3	1 45.8	128 15.8	8 33.1	0.85935	1.28729	6.60	0.8195	
	18	0.6289	1.009	-0.005	26 7.6	1 44.5	127 16.6	8 29.1	0.86393	1.28668	6.68	0.8247	
	19	0.6316	1.016	+0.002	25 38.1	1 42.5	126 17.3	8 25.2	0.86824	1.28607	6.76	0.8297	
	20	0.6344	1.023	0.008	25 1.5	1 40.1	125 17.7	8 21.2	0.87170	1.28547	6.83	0.8345	
	(22.0)	21	0.6371	+1.030	+0.012	24 21.9	1 37.5	124 18.0	8 17.2	+0.87403	+1.28488	+6.90	+0.8392
	22	0.6399	1.037	0.014	23 43.9	1 34.9	123 18.1	8 13.2	0.87520	1.28430	6.98	0.8437	
	23	0.6426	1.043	0.012	23 11.7	1 32.8	122 18.0	8 9.2	0.87553	1.28373	7.05	0.8480	
	24	0.6453	1.050	0.008	22 48.1	1 31.2	121 17.7	8 5.2	0.87538	1.28316	7.12	0.8522	
	25	0.6481	1.057	+0.003	22 33.5	1 30.2	120 17.2	8 1.2	0.87526	1.28261	7.18	0.8561	
	26	0.6508	+1.063	-0.002	22 26.7	1 29.8	119 16.6	7 57.1	+0.87561	+1.28206	+7.24	+0.8600	
	27	0.6536	1.070	0.005	22 24.6	1 29.6	118 15.8	7 53.1	0.87667	1.28153	7.31	0.8637	
	28	0.6563	1.076	0.007	22 23.9	1 29.6	117 14.8	7 49.0	0.87853	1.28101	7.37	0.8672	
	29	0.6590	1.082	0.007	22 21.6	1 29.4	116 13.6	7 44.9	0.88105	1.28050	7.42	0.8706	
	30	0.6618	1.089	0.005	22 15.7	1 29.0	115 12.2	7 40.8	0.88397	1.28000	7.48	0.8738	
	Sept.	31	0.6645	+1.095	-0.002	22 5.1	1 28.3	114 10.7	7 36.7	+0.88706	+1.27953	+7.53	+0.8769
1		0.6672	1.101	+0.002	21 49.5	1 27.3	113 9.0	7 32.6	0.89007	1.27906	7.58	0.8799	
2		0.6700	1.107	0.005	21 29.1	1 25.9	112 7.2	7 28.5	0.89281	1.27861	7.63	0.8827	
3		0.6727	1.113	0.008	21 4.9	1 24.3	111 5.1	7 24.3	0.89508	1.27818	7.68	0.8854	
4		0.6754	1.119	0.010	20 38.3	1 22.6	110 2.9	7 20.2	0.89755	1.27776	7.73	0.8879	
(23.0)		5	0.6782	+1.125	+0.010	20 10.9	1 20.7	109 0.6	+0.89777	+1.27736	+7.77	+0.8903	
6		0.6809	1.131	0.008	19 45.3	1 19.0	107 58.1	7 11.9	0.89811	1.27698	7.81	0.8925	
7		0.6837	1.136	+0.004	19 24.0	1 17.6	106 55.5	7 7.7	0.89792	1.27661	7.85	0.8946	
8		0.6864	1.142	-0.001	19 9.4	1 16.6	105 52.7	7 3.5	0.89749	1.27627	7.88	0.8966	
9		0.6891	1.148	0.007	19 2.9	1 16.2	104 49.8	6 59.3	0.89716	1.27594	7.92	0.8985	
10		0.6919	+1.154	-0.012	19 3.9	1 16.3	103 46.8	6 55.1	+0.89742	+1.27564	+7.95	+0.9002	
11		0.6946	1.159	0.015	19 9.7	1 16.6	102 43.7	6 50.9	0.89865	1.27536	7.98	0.9018	
12		0.6974	1.165	0.016	19 16.3	1 17.1	101 40.5	6 46.7	0.90009	1.27509	8.00	0.9033	
13		0.7001	1.171	0.013	19 19.4	1 17.3	100 37.2	6 42.5	0.90433	1.27485	8.03	0.9046	
14		0.7028	1.176	-0.007	19 14.9	1 17.0	99 33.8	6 38.3	0.90830	1.27463	8.05	0.9058	
15		0.7056	+1.182	0.000	19 1.5	1 16.1	98 30.3	6 34.0	+0.91229	+1.27443	+8.07	+0.9069	
16	0.7083	1.187	+0.006	18 40.1	1 14.7	97 26.7	6 29.8	0.91581	1.27426	8.09	0.9079		
17	0.7110	1.193	0.011	18 13.6	1 12.9	96 23.1	6 25.5	0.91839	1.27411	8.10	0.9087		
18	0.7138	1.198	0.013	17 46.1	1 11.1	95 19.3	6 21.3	0.91995	1.27398	8.12	0.9094		
19	0.7165	1.204	0.012	17 21.9	1 9.5	94 15.4	6 17.0	0.92059	1.27387	8.13	0.9099		
20	0.7193	+1.209	+0.009	17 4.3	1 8.3	93 11.6	6 12.8	+0.92061	+1.27379	+8.14	+0.9104		
(0.0)	21	0.7220	1.215	+0.004	16 55.0	1 7.7	92 7.7	0.92044	1.27373	8.14	0.9107		
22	0.7247	1.220	-0.001	16 53.4	1 7.6	91 3.7	6 4.2	0.92052	1.27369	8.14	0.9109		
23	0.7275	1.225	0.005	16 57.6	1 7.8	89 59.7	6 0.0	0.92121	1.27368	8.15	0.9110		
24	0.7302	1.231	0.008	17 4.7	1 8.3	88 55.6	5 55.7	0.92264	1.27369	8.14	0.9109		
25	0.7330	+1.236	-0.008	17 11.5	1 8.8	87 51.5	5 51.4	+0.92474	+1.27373	+8.14	+0.9107		
26	0.7357	1.242	0.006	17 15.8	1 9.1	86 47.4	5 47.2	0.92737	1.27379	8.14	0.9104		
27	0.7384	1.247	-0.003	17 16.1	1 9.1	85 43.3	5 42.9	0.93026	1.27387	8.13	0.9099		
28	0.7412	1.253	0.000	17 11.7	1 8.8	84 39.1	5 38.6	0.93321	1.27398	8.12	0.9093		
29	0.7439	1.258	+0.004	17 2.6	1 8.2	83 35.0	5 34.3	0.93601	1.27411	8.10	0.9086		
30	0.7466	+1.264	+0.007	16 49.6	1 7.3	82 30.8	5 30.1	+0.93849	+1.27427	+8.09	+0.9078		
Oct.	1	0.7494	+1.269	+0.009	16 33.7	1 6.2	81 26.7	5 25.8	+0.94050	+1.27444	+8.07	+0.9069	

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f'$	$f''$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .		
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	y	s	s	°	h m	°	h m			"			
Oct.	1	0.7494	+1.269	+0.009	16 33.7	1 6.2	81 26.7	5 25.8	+0.94050	+1.27444	+8.07	+0.9069	
	2	0.7521	1.275	0.010	16 16.1	1 5.1	80 22.5	5 21.5	0.94193	1.27464	8.05	0.9058	
	3	0.7548	1.280	0.008	15 59.1	1 3.9	79 18.4	5 17.2	0.94277	1.27487	8.03	0.9045	
	4	0.7576	1.286	+0.005	15 44.9	1 3.0	78 14.3	5 12.9	0.94308	1.27511	8.00	0.9032	
	h (1.0)	5	0.7603	1.292	0.000	15 35.8	1 2.4	77 10.3	5 8.7	0.94306	1.27538	7.97	0.9017
	6	0.7631	+1.297	-0.005	15 33.7	1 2.2	76 6.3	5 4.4	+0.94303	+1.27567	+7.94	+0.9000	
	7	0.7658	1.303	0.010	15 38.7	1 2.6	75 2.4	5 0.2	0.94334	1.27598	7.91	0.8983	
	8	0.7685	1.309	0.014	15 49.3	1 3.3	73 58.5	4 55.9	0.94442	1.27632	7.88	0.8964	
	9	0.7713	1.315	0.015	16 2.4	1 4.2	72 54.6	4 51.6	0.94649	1.27667	7.84	0.8943	
	10	0.7740	1.321	0.013	16 13.8	1 4.9	71 50.9	4 47.4	0.94956	1.27704	7.80	0.8921	
	11	0.7768	+1.327	-0.008	16 19.7	1 5.3	70 47.2	4 43.1	+0.95335	+1.27744	+7.76	+0.8898	
	12	0.7795	1.333	-0.002	16 17.7	1 5.2	69 43.6	4 38.9	0.95742	1.27785	7.72	0.8873	
	13	0.7822	1.339	+0.005	16 7.8	1 4.5	68 40.1	4 34.7	0.96122	1.27828	7.67	0.8847	
	14	0.7850	1.345	0.010	15 51.7	1 3.4	67 36.7	4 30.4	0.96435	1.27873	7.62	0.8820	
	15	0.7877	1.351	0.013	15 33.0	1 2.2	66 33.4	4 26.2	0.96657	1.27919	7.57	0.8791	
	16	0.7904	+1.357	+0.013	15 15.4	1 1.0	65 30.3	4 22.0	+0.96790	+1.27967	+7.52	+0.8760	
	17	0.7932	1.364	0.010	15 2.7	1 0.2	64 27.2	4 17.8	0.96853	1.28017	7.46	0.8728	
	18	0.7959	1.370	+0.005	14 57.0	0 59.8	63 24.2	4 13.6	0.96882	1.28068	7.40	0.8694	
	19	0.7987	1.377	0.000	14 58.6	0 59.9	62 21.4	4 9.4	0.96922	1.28121	7.34	0.8658	
	h (2.0)	20	0.8014	1.383	-0.005	15 6.0	1 0.4	61 18.7	4 5.2	0.97008	1.28175	7.28	0.8621
	21	0.8041	+1.390	-0.008	15 17.0	1 1.1	60 16.1	4 1.1	+0.97160	+1.28231	+7.22	+0.8583	
	22	0.8069	1.396	0.008	15 28.5	1 1.9	59 13.6	3 56.9	0.97383	1.28287	7.15	0.8542	
	23	0.8096	1.403	0.007	15 38.1	1 2.5	58 11.3	3 52.8	0.97662	1.28345	7.08	0.8500	
	24	0.8124	1.410	0.005	15 44.2	1 2.9	57 9.1	3 48.6	0.97977	1.28404	7.01	0.8456	
	25	0.8151	1.417	-0.001	15 45.9	1 3.1	56 7.0	3 44.5	0.98306	1.28464	6.94	0.8411	
	26	0.8178	+1.424	+0.003	15 43.3	1 2.9	55 5.0	3 40.3	+0.98625	+1.28525	+6.86	+0.8363	
	27	0.8206	1.431	0.006	15 36.7	1 2.4	54 3.2	3 36.2	0.98919	1.28587	6.78	0.8314	
	28	0.8233	1.438	0.008	15 26.8	1 1.8	53 1.6	3 32.1	0.99174	1.28649	6.70	0.8263	
	29	0.8260	1.445	0.009	15 15.0	1 1.0	52 0.0	3 28.0	0.99382	1.28712	6.62	0.8209	
	30	0.8288	1.453	0.009	15 2.9	1 0.2	50 58.6	3 23.9	0.99539	1.28776	6.54	0.8154	
	Nov.	31	0.8315	+1.460	+0.006	14 52.5	0 59.5	49 57.4	3 19.8	+0.99645	+1.28840	+6.45	+0.8097
1		0.8342	1.468	+0.002	14 45.6	0 59.0	48 56.3	3 15.8	0.99717	1.28905	6.36	0.8037	
2		0.8370	1.476	-0.004	14 44.3	0 59.0	47 55.4	3 11.7	0.99776	1.28970	6.27	0.7975	
3		0.8397	1.483	0.009	14 49.0	0 59.3	46 54.5	3 7.6	0.99860	1.29035	6.18	0.7911	
h (3.0)		4	0.8425	1.491	0.013	14 56.1	0 59.9	45 53.9	3 3.6	1.00001	1.29101	6.09	0.7845
5		0.8452	+1.499	-0.015	15 12.2	1 0.8	44 53.4	2 59.6	+1.00227	+1.29166	+5.99	+0.7776	
6		0.8479	1.507	0.014	15 24.9	1 1.7	43 53.1	2 55.5	1.00540	1.29232	5.89	0.7705	
7		0.8507	1.516	0.010	15 33.7	1 2.2	42 52.9	2 51.5	1.00929	1.29298	5.79	0.7631	
8		0.8534	1.524	-0.004	15 35.9	1 2.4	41 52.8	2 47.5	1.01358	1.29363	5.69	0.7554	
9		0.8562	1.532	+0.003	15 30.7	1 2.0	40 52.9	2 43.5	1.01782	1.29428	5.59	0.7475	
10		0.8589	+1.541	+0.010	15 19.2	1 1.3	39 53.2	2 39.6	+1.02156	+1.29493	+5.49	+0.7392	
11		0.8616	1.549	0.014	15 3.9	1 0.3	38 53.7	2 35.6	1.02452	1.29558	5.38	0.7307	
12		0.8644	1.558	0.015	14 48.4	0 59.2	37 54.2	2 31.6	1.02664	1.29622	5.27	0.7219	
13		0.8671	1.567	0.012	14 35.9	0 58.4	36 55.0	2 27.7	1.02803	1.29686	5.16	0.7127	
14		0.8698	1.576	0.008	14 28.9	0 57.9	35 55.9	2 23.7	1.02899	1.29749	5.05	0.7032	
15		0.8726	+1.585	+0.003	14 28.2	0 57.9	34 56.9	2 19.8	+1.02986	+1.29811	+4.94	+0.6934	
16		0.8753	+1.594	-0.003	14 33.2	0 58.2	33 58.1	2 15.9	+1.03106	+1.29872	+4.82	+0.6832	

## INDEPENDENT STAR-NUMBERS, 1907.

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(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f'$		$f''$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
Nov.	16	0.8753	+1.594	-0.003	14 33.2	0 58.2	33 58.1	2 15.9	+1.03106	+1.29872	+4.82	+0.6832	
	17	0.8781	1.603	0.007	14 41.8	0 58.8	32 59.4	2 12.0	1.03280	1.29933	4.70	0.6726	
	18	0.8808	1.612	0.008	14 51.6	0 59.4	32 0.9	2 8.1	1.03516	1.29993	4.59	0.6616	
	19	0.8835	1.621	0.008	15 0.2	1 0.0	31 2.5	2 4.2	1.03808	1.30052	4.47	0.6501	
	20	0.8863	1.631	0.006	15 5.7	1 0.4	30 4.2	2 0.3	1.04139	1.30110	4.35	0.6382	
	21	0.8890	+1.640	-0.002	15 7.4	1 0.5	29 6.0	1 56.4	+1.04488	+1.30166	+4.23	+0.6259	
	22	0.8918	1.650	+0.001	15 5.0	1 0.3	28 8.0	1 52.5	1.04835	1.30222	4.10	0.6130	
	23	0.8945	1.660	0.005	14 58.7	0 59.9	27 10.1	1 48.7	1.05160	1.30276	3.98	0.5996	
	24	0.8972	1.669	0.008	14 49.3	0 59.3	26 12.4	1 44.8	1.05453	1.30329	3.85	0.5856	
	25	0.9000	1.679	0.009	14 37.8	0 58.5	25 14.7	1 41.0	1.05704	1.30381	3.72	0.5710	
	26	0.9027	+1.689	+0.009	14 25.3	0 57.7	24 17.1	1 37.1	+1.05910	+1.30432	+3.60	+0.5557	
	27	0.9054	1.699	0.007	14 13.6	0 56.9	23 19.7	1 33.3	1.06073	1.30480	3.47	0.5398	
	28	0.9082	1.709	+0.003	14 4.3	0 56.3	22 22.4	1 29.5	1.06197	1.30528	3.33	0.5231	
	29	0.9109	1.720	-0.003	13 59.1	0 55.9	21 25.1	1 25.7	1.06301	1.30574	3.20	0.5055	
	30	0.9136	1.730	0.008	13 58.9	0 55.9	20 28.0	1 21.9	1.06415	1.30618	3.07	0.4871	
	Dec.	1	0.9164	+1.740	-0.013	14 3.5	0 56.2	19 30.9	1 18.1	+1.06566	+1.30661	+2.94	+0.4677
		2	0.9191	1.751	0.016	14 11.3	0 56.8	18 33.9	1 14.3	1.06781	1.30702	2.80	0.4472
3		0.9219	1.761	0.016	14 19.8	0 57.3	17 37.1	1 10.5	1.07073	1.30741	2.67	0.4256	
4		0.9246	1.771	0.013	14 25.9	0 57.7	16 40.3	1 6.7	1.07438	1.30778	2.53	0.4027	
5		0.9273	1.782	-0.007	14 27.0	0 57.8	15 43.5	1 2.9	1.07849	1.30814	2.39	0.3784	
6		0.9301	+1.792	+0.001	14 21.7	0 57.4	14 46.9	0 59.1	+1.08269	+1.30848	+2.25	+0.3525	
7		0.9328	1.803	0.008	14 10.2	0 56.7	13 50.3	0 55.4	1.08658	1.30879	2.11	0.3248	
8		0.9356	1.814	0.013	13 54.4	0 55.6	12 53.8	0 51.6	1.08988	1.30909	1.97	0.2951	
9		0.9383	1.825	0.015	13 37.2	0 54.5	11 57.4	0 47.8	1.09243	1.30937	1.83	0.2630	
10		0.9410	1.835	0.014	13 21.5	0 53.4	11 1.0	0 44.1	1.09425	1.30963	1.69	0.2282	
11		0.9438	+1.846	+0.011	13 9.8	0 52.7	10 4.7	0 40.3	+1.09554	+1.30987	+1.55	+0.1902	
12		0.9465	1.857	+0.005	13 3.5	0 52.2	9 8.4	0 36.6	1.09663	1.31009	1.41	0.1484	
13		0.9492	1.868	0.000	13 2.4	0 52.2	8 12.2	0 32.8	1.09783	1.31029	1.27	0.1019	
14		0.9520	1.879	-0.005	13 5.1	0 52.3	7 16.0	0 29.1	1.09941	1.31047	1.12	0.0498	
15		0.9547	1.890	0.008	13 9.7	0 52.6	6 19.9	0 25.3	1.10148	1.31062	0.98	0.9905	
16		0.9575	+1.901	-0.008	13 13.9	0 52.9	5 23.8	0 21.6	+1.10406	+1.31076	+0.83	+0.9213	
17		0.9602	1.912	0.006	13 15.9	0 53.1	4 27.7	0 17.8	1.10703	1.31087	0.69	0.8390	
18	0.9629	1.923	-0.003	13 14.8	0 53.0	3 31.6	0 14.1	1.11019	1.31096	0.55	0.7372		
19	0.9657	1.934	0.000	13 10.0	0 52.7	2 35.5	0 10.4	1.11338	1.31104	0.40	0.6037		
20	0.9684	1.945	+0.004	13 1.8	0 52.1	1 39.5	0 6.6	1.11643	1.31108	0.26	0.4097		
21	0.9712	+1.957	+0.007	12 50.6	0 51.4	0 43.4	0 2.9	+1.11926	+1.31111	+0.11	+0.0497		
22	0.9739	1.968	0.009	12 37.1	0 50.5	359 47.4	23 59.2	1.12172	1.31112	-0.03	-8.5138		
23	0.9766	1.979	0.009	12 22.5	0 49.5	358 51.3	23 55.4	1.12378	1.31110	0.18	9.2491		
24	0.9794	1.990	0.008	12 7.9	0 48.5	357 55.2	23 51.7	1.12541	1.31106	0.32	9.5081		
25	0.9821	2.001	+0.004	11 55.0	0 47.7	356 59.1	23 47.9	1.12668	1.31100	0.47	9.6692		
26	0.9848	+2.012	-0.001	11 45.0	0 47.0	356 3.0	23 44.2	+1.12769	+1.31092	-0.61	-9.7864		
27	0.9876	2.023	0.007	11 39.1	0 46.6	355 6.8	23 40.5	1.12864	1.31082	0.76	9.8784		
28	0.9903	2.034	0.012	11 37.6	0 46.5	354 10.6	23 36.7	1.12979	1.31070	0.90	9.9542		
29	0.9930	2.045	0.016	11 39.5	0 46.6	353 14.4	23 33.0	1.13139	1.31055	1.04	0.0187		
30	0.9958	2.056	0.017	11 43.2	0 46.9	352 18.1	23 29.2	1.13361	1.31039	1.19	0.0746		
31	0.9985	+2.067	-0.015	11 45.9	0 47.1	351 21.7	23 25.4	+1.13647	+1.31020	-1.33	-0.1241		
32	1.0013	+2.078	-0.010	11 45.2	0 47.0	350 25.3	23 21.7	+1.13986	+1.30999	-1.47	-0.1684		

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hrv.).			6 Ursæ Min. (B.).			δ Ursæ Min.			λ Ursæ Min.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.
Jan.	h m 1 25	° +88 48	Jan.	h m 6 57	° +87 11	Jan.	h m 12 14	° +88 12	Jan.	h m 18 1	° +86 36	Jan.	h m 19 13	° +88 59
	s	"		s	"		s	"		s	"		s	"
0.3	58.87	50.3	0.5	28.47	40.5	0.7	16.99	41.1	0.9	58.92	52.5	1.0	37.26	69.9
1.3	57.77	50.4	1.5	28.62	40.9	1.7	17.81	41.0	1.9	58.93	52.1	2.0	36.81	69.5
2.3	56.63	50.6	2.5	28.75	41.2	2.7	18.64	41.0	2.9	58.96	51.7	3.0	36.43	69.2
3.3	55.47	50.7	3.5	28.84	41.6	3.7	19.46	41.0	3.9	59.02	51.4	4.0	36.14	68.8
4.3	54.34	50.8	4.5	28.92	42.0	4.7	20.25	41.0	4.9	59.10	51.0	5.0	35.93	68.4
5.3	53.26	50.9	5.5	28.98	42.3	5.7	20.98	41.1	5.9	59.17	50.7	6.0	35.77	68.1
6.3	52.22	50.9	6.5	29.02	42.6	6.7	21.68	41.1	6.9	59.23	50.4	7.0	35.61	67.8
7.3	51.23	51.0	7.5	29.06	42.9	7.7	22.35	41.1	7.9	59.30	50.0	8.0	35.44	67.5
8.3	50.28	51.0	8.5	29.12	43.2	8.7	23.00	41.2	8.9	59.35	49.7	9.0	35.23	67.2
9.3	49.37	51.1	9.5	29.18	43.5	9.7	23.65	41.2	9.9	59.40	49.4	9.9	34.99	66.9
10.3	48.46	51.2	10.5	29.26	43.8	10.7	24.32	41.2	10.9	59.43	49.1	10.9	34.70	66.6
11.3	47.49	51.3	11.5	29.34	44.1	11.7	25.02	41.2	11.9	59.46	48.8	11.9	34.40	66.2
12.2	46.49	51.4	12.5	29.43	44.4	12.7	25.74	41.2	12.9	59.51	48.4	12.9	34.10	65.9
13.2	45.44	51.5	13.5	29.51	44.8	13.7	26.51	41.3	13.9	59.56	48.1	13.9	33.86	65.6
14.2	44.32	51.6	14.5	29.57	45.1	14.7	27.30	41.3	14.9	59.64	47.7	14.9	33.66	65.2
15.2	43.15	51.6	15.5	29.60	45.5	15.7	28.09	41.4	15.9	59.74	47.3	15.9	33.55	64.8
16.2	41.96	51.6	16.5	29.59	45.9	16.7	28.88	41.4	16.9	59.87	47.0	16.9	33.54	64.4
17.2	40.78	51.7	17.5	29.56	46.2	17.7	29.66	41.5	17.9	60.03	46.6	17.9	33.61	64.1
18.2	39.62	51.7	18.5	29.59	46.6	18.7	30.39	41.6	18.9	60.20	46.3	18.9	33.76	63.7
19.2	38.50	51.6	19.5	29.41	46.9	19.7	31.07	41.8	19.9	60.38	46.0	19.9	33.94	63.3
20.2	37.45	51.6	20.5	29.32	47.2	20.7	31.72	41.9	20.9	60.56	45.7	20.9	34.14	63.0
21.2	36.45	51.6	21.5	29.23	47.5	21.7	32.33	42.0	21.9	60.72	45.4	21.9	34.34	62.7
22.2	35.48	51.5	22.5	29.15	47.8	22.7	32.93	42.1	22.9	60.88	45.1	22.9	34.52	62.4
23.2	34.53	51.5	23.5	29.08	48.1	23.7	33.53	42.2	23.9	61.03	44.9	23.9	34.65	62.1
24.2	33.58	51.5	24.4	29.02	48.4	24.7	34.14	42.3	24.9	61.17	44.6	24.9	34.75	61.8
25.2	32.60	51.5	25.4	28.97	48.7	25.7	34.79	42.4	25.9	61.31	44.3	25.9	34.85	61.5
26.2	31.57	51.5	26.4	28.93	49.0	26.7	35.47	42.5	26.9	61.45	44.0	26.9	34.95	61.2
27.2	30.48	51.5	27.4	28.87	49.3	27.7	36.17	42.6	27.9	61.62	43.6	27.9	35.09	60.9
28.2	29.35	51.4	28.4	28.78	49.7	28.7	36.90	42.7	28.9	61.81	43.3	28.9	35.29	60.5
29.2	28.18	51.4	29.4	28.68	50.0	29.7	37.62	42.8	29.9	62.02	43.0	29.9	35.56	60.1
30.2	27.01	51.3	30.4	28.54	50.4	30.6	38.32	43.0	30.9	62.24	42.6	30.9	35.92	59.8
31.2	25.85	51.2	31.4	28.36	50.7	31.6	39.00	43.2	31.9	62.49	42.3	31.9	36.36	59.4
32.2	24.74	51.1	32.4	28.17	51.0	32.6	39.64	43.4	32.9	62.75	42.0	32.9	36.84	59.1

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hev.).			6 Ursæ Min. (B.).			δ Ursæ Min.			λ Ursæ Min.		
Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.
Feb.	h m 1 24	° +88 48	Feb.	h m 6 57	° +87 11	Feb.	h m 12 14	° +88 12	Feb.	h m 18 2	° +86 36	Feb.	h m 19 13	° +88 59
	s	"		s	"		s	"		s	"		s	"
1.2	84.74	51.1	1.4	28.17	51.0	1.6	39.64	43.4	1.9	2.75	42.0	1.9	36.84	59.1
2.2	83.68	51.0	2.4	27.98	51.3	2.6	40.22	43.6	2.9	3.00	41.8	2.9	37.35	58.8
3.2	82.70	50.9	3.4	27.77	51.6	3.6	40.76	43.8	3.9	3.25	41.5	3.9	37.87	58.5
4.2	81.76	50.8	4.4	27.58	51.9	4.6	41.27	44.0	4.9	3.50	41.3	4.9	38.36	58.2
5.2	80.87	50.7	5.4	27.39	52.2	5.6	41.77	44.2	5.9	3.73	41.1	5.9	38.81	57.9
6.2	80.01	50.6	6.4	27.22	52.4	6.6	42.28	44.4	6.9	3.94	40.9	6.9	39.23	57.7
7.2	79.13	50.5	7.4	27.08	52.7	7.6	42.81	44.6	7.9	4.16	40.7	7.9	39.60	57.4
8.2	78.21	50.4	8.4	26.93	52.9	8.6	43.35	44.8	8.9	4.37	40.4	8.9	39.97	57.1
9.2	77.25	50.3	9.4	26.77	53.2	9.6	43.93	44.9	9.9	4.59	40.1	9.9	40.36	56.8
10.2	76.25	50.2	10.4	26.60	53.5	10.6	44.54	45.1	10.9	4.82	39.8	10.9	40.80	56.5
11.2	75.20	50.1	11.4	26.42	53.9	11.6	45.15	45.3	11.9	5.08	39.6	11.9	41.31	56.1
12.2	74.14	50.0	12.4	26.20	54.2	12.6	45.75	45.5	12.9	5.37	39.3	12.9	41.91	55.8
13.2	73.06	49.9	13.4	25.94	54.5	13.6	46.34	45.8	13.9	5.68	39.0	13.9	42.59	55.5
14.2	72.02	49.7	14.4	25.67	54.8	14.6	46.88	46.1	14.9	6.01	38.8	14.9	43.36	55.2
15.2	71.04	49.5	15.4	25.37	55.0	15.6	47.37	46.4	15.8	6.34	38.6	15.9	44.18	54.9
16.2	70.11	49.3	16.4	25.05	55.3	16.6	47.82	46.6	16.8	6.68	38.4	16.9	45.03	54.6
17.2	69.25	49.1	17.4	24.74	55.5	17.6	48.23	46.9	17.8	7.01	38.2	17.9	45.86	54.4
18.2	68.45	48.9	18.4	24.43	55.7	18.6	48.60	47.1	18.8	7.31	38.1	18.9	46.66	54.1
19.1	67.68	48.7	19.4	24.14	55.9	19.6	48.96	47.4	19.8	7.61	37.9	19.9	47.43	53.9
20.1	66.95	48.5	20.4	23.86	56.2	20.6	49.32	47.6	20.8	7.90	37.8	20.9	48.14	53.7
21.1	66.19	48.3	21.4	23.58	56.4	21.6	49.71	47.8	21.8	8.18	37.6	21.9	48.82	53.4
22.1	65.40	48.2	22.4	23.32	56.6	22.6	50.12	48.1	22.8	8.47	37.4	22.9	49.51	53.2
23.1	64.57	48.0	23.4	23.06	56.8	23.6	50.56	48.3	23.8	8.76	37.2	23.9	50.23	52.9
24.1	63.70	47.8	24.4	22.78	57.1	24.6	51.02	48.5	24.8	9.08	37.0	24.9	51.01	52.7
25.1	62.80	47.6	25.4	22.47	57.3	25.6	51.48	48.8	25.8	9.42	36.8	25.9	51.85	52.4
26.1	61.88	47.4	26.4	22.16	57.6	26.6	51.92	49.1	26.8	9.77	36.6	26.9	52.75	52.1
27.1	60.99	47.2	27.4	21.79	57.8	27.6	52.34	49.4	27.8	10.13	36.4	27.9	53.73	51.9
28.1	60.14	47.0	28.4	21.42	58.0	28.6	52.71	49.7	28.8	10.51	36.3	28.9	54.76	51.6
29.1	59.35	46.7	29.3	21.03	58.2	29.6	53.02	50.0	29.8	10.89	36.2	29.9	55.81	51.4
30.1	58.62	46.4	30.3	20.63	58.4	30.6	53.29	50.4	30.8	11.26	36.1	30.9	56.86	51.2

CIRCUMPOLAR STARS.														
APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.														
Mean Solar Date.	α Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.		Right Ascen- sion.	Declina- tion North.
Mar.	h m 1 24	° ' " +88 48	Mar.	h m 6 57	° ' " +87 11	Mar.	h m 12 14	° ' " +88 12	Mar.	h m 18 2	° ' " +86 36	Mar.	h m 19 13	° ' " +88 59
	s "			s "			s "			s "			s "	
1.1	59.35	46.7	1.3	21.03	58.2	1.6	53.02	50.0	1.8	10.89	36.2	1.9	55.81	51.4
2.1	58.62	46.4	2.3	20.63	58.4	2.6	53.29	50.4	2.8	11.26	36.1	2.9	56.86	51.2
3.1	57.98	46.2	3.3	20.24	58.6	3.6	53.52	50.7	3.8	11.62	36.0	3.9	57.91	51.0
4.1	57.39	45.9	4.3	19.87	58.8	4.6	53.73	51.0	4.8	11.97	35.9	4.9	58.90	50.9
5.1	56.85	45.7	5.3	19.52	58.9	5.6	53.92	51.2	5.8	12.29	35.8	5.9	59.84	50.7
6.1	56.31	45.4	6.3	19.18	59.0	6.6	54.13	51.5	6.8	12.59	35.7	6.8	60.73	50.5
7.1	55.75	45.2	7.3	18.86	59.2	7.6	54.35	51.8	7.8	12.90	35.6	7.8	61.59	50.4
8.1	55.17	45.0	8.3	18.55	59.3	8.6	54.61	52.1	8.8	13.20	35.5	8.8	62.45	50.2
9.1	54.55	44.8	9.3	18.23	59.5	9.5	54.89	52.3	9.8	13.52	35.4	9.8	63.35	50.0
10.1	53.89	44.5	10.3	17.89	59.7	10.5	55.17	52.6	10.8	13.87	35.3	10.8	64.29	49.8
11.1	53.19	44.3	11.3	17.52	59.9	11.5	55.45	52.9	11.8	14.23	35.2	11.8	65.31	49.6
12.1	52.51	44.0	12.3	17.13	60.1	12.5	55.72	53.3	12.8	14.61	35.1	12.8	66.42	49.4
13.1	51.85	43.7	13.3	16.72	60.2	13.5	55.95	53.6	13.8	15.00	35.0	13.8	67.58	49.2
14.1	51.23	43.4	14.3	16.27	60.4	14.5	56.13	54.0	14.8	15.40	35.0	14.8	68.80	49.0
15.1	50.69	43.1	15.3	15.81	60.5	15.5	56.26	54.3	15.8	15.80	34.9	15.8	70.06	48.9
16.1	50.22	42.8	16.3	15.36	60.6	16.5	56.33	54.7	16.8	16.21	34.9	16.8	71.30	48.8
17.1	49.82	42.5	17.3	14.93	60.7	17.5	56.37	55.0	17.8	16.59	34.9	17.8	72.51	48.7
18.1	49.48	42.2	18.3	14.50	60.8	18.5	56.40	55.3	18.8	16.95	34.9	18.8	73.68	48.6
19.1	49.16	41.9	19.3	14.08	60.8	19.5	56.42	55.6	19.8	17.29	35.0	19.8	74.79	48.5
20.1	48.85	41.6	20.3	13.69	60.9	20.5	56.45	55.9	20.8	17.63	35.0	20.8	75.86	48.4
21.1	48.52	41.3	21.3	13.32	60.9	21.5	56.50	56.2	21.8	17.96	35.0	21.8	76.89	48.3
22.1	48.16	41.0	22.3	12.96	61.0	22.5	56.58	56.4	22.8	18.29	34.9	22.8	77.93	48.2
23.1	47.76	40.8	23.3	12.57	61.1	23.5	56.68	56.7	23.7	18.64	34.9	23.8	79.01	48.1
24.1	47.32	40.5	24.3	12.17	61.2	24.5	56.79	57.0	24.7	19.00	34.9	24.8	80.13	48.0
25.1	46.89	40.2	25.3	11.76	61.3	25.5	56.88	57.4	25.7	19.38	34.8	25.8	81.29	47.9
26.0	46.46	39.9	26.3	11.33	61.4	26.5	56.95	57.7	26.7	19.77	34.8	26.8	82.53	47.8
27.0	46.07	39.6	27.3	10.86	61.5	27.5	56.98	58.0	27.7	20.17	34.8	27.8	83.83	47.7
28.0	45.74	39.3	28.3	10.40	61.6	28.5	56.96	58.4	28.7	20.57	34.9	28.8	85.13	47.6
29.0	45.48	38.9	29.3	9.94	61.6	29.5	56.89	58.7	29.7	20.96	35.0	29.8	86.45	47.5
30.0	45.30	38.6	30.3	9.46	61.6	30.5	56.78	59.1	30.7	21.33	35.0	30.8	87.74	47.5
31.0	45.20	38.2	31.3	9.01	61.6	31.5	56.63	59.4	31.7	21.69	35.1	31.8	88.97	47.5
32.0	45.14	37.9	32.3	8.58	61.6	32.5	56.47	59.7	32.7	22.03	35.2	32.8	90.15	47.5



CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Apr.	h m 1 24	° ' 48	Apr.	h m 6 56	° ' 11	Apr.	h m 12 14	° ' 12	Apr.	h m 18 2	° ' 36	Apr.	h m 19 14	° ' 59
	s	"		s	"		s	"		s	"		s	"
1.0	45.14	37.9	1.3	68.58	61.6	1.5	56.47	59.7	1.7	22.03	35.2	1.8	30.15	47.5
2.0	45.12	37.6	2.3	68.18	61.5	2.5	56.31	60.0	2.7	22.35	35.3	2.8	31.26	47.5
3.0	45.09	37.3	3.3	67.80	61.5	3.5	56.16	60.3	3.7	22.65	35.4	3.8	32.33	47.5
4.0	45.04	37.1	4.3	67.43	61.5	4.5	56.04	60.6	4.7	22.95	35.5	4.8	33.36	47.5
5.0	44.95	36.8	5.3	67.07	61.5	5.5	55.94	60.8	5.7	23.26	35.5	5.8	34.41	47.4
6.0	44.82	36.5	6.3	66.70	61.5	6.5	55.87	61.1	6.7	23.58	35.6	6.8	35.49	47.4
7.0	44.67	36.2	7.2	66.31	61.6	7.5	55.79	61.4	7.7	23.91	35.6	7.8	36.62	47.4
8.0	44.51	35.9	8.2	65.90	61.6	8.5	55.70	61.7	8.7	24.26	35.7	8.8	37.82	47.4
9.0	44.36	35.6	9.2	65.46	61.6	9.5	55.59	62.1	9.7	24.63	35.8	9.8	39.08	47.3
10.0	44.25	35.3	10.2	65.01	61.6	10.5	55.44	62.4	10.7	25.01	35.9	10.8	40.38	47.3
11.0	44.22	35.0	11.2	64.54	61.6	11.5	55.22	62.7	11.7	25.38	36.0	11.7	41.71	47.3
12.0	44.25	34.6	12.2	64.07	61.5	12.5	54.96	63.1	12.7	25.74	36.2	12.7	43.02	47.4
13.0	44.36	34.3	13.2	63.62	61.4	13.5	54.66	63.4	13.7	26.09	36.3	13.7	44.32	47.4
13.9	44.52	33.9	14.2	63.18	61.3	14.5	54.33	63.7	14.7	26.41	36.5	14.7	45.56	47.5
14.9	44.73	33.6	15.2	62.76	61.2	15.4	54.00	63.9	15.7	26.73	36.7	15.7	46.73	47.6
15.9	44.96	33.3	16.2	62.38	61.1	16.4	53.68	64.2	16.7	27.02	36.9	16.7	47.84	47.7
16.9	45.18	33.0	17.2	62.00	61.0	17.4	53.38	64.4	17.7	27.30	37.0	17.7	48.90	47.8
17.9	45.38	32.7	18.2	61.64	60.9	18.4	53.09	64.7	18.7	27.58	37.2	18.7	49.93	47.8
18.9	45.53	32.5	19.2	61.29	60.9	19.4	52.84	64.9	19.7	27.85	37.3	19.7	50.98	47.9
19.9	45.65	32.2	20.2	60.93	60.8	20.4	52.61	65.1	20.7	28.14	37.4	20.7	52.05	47.9
20.9	45.75	31.9	21.2	60.56	60.7	21.4	52.37	65.4	21.7	28.44	37.6	21.7	53.16	48.0
21.9	45.83	31.6	22.2	60.17	60.7	22.4	52.11	65.7	22.7	28.76	37.7	22.7	54.33	48.0
22.9	45.95	31.3	23.2	59.76	60.6	23.4	51.83	66.0	23.7	29.08	37.9	23.7	55.55	48.1
23.9	46.14	31.0	24.2	59.33	60.5	24.4	51.51	66.3	24.7	29.40	38.0	24.7	56.79	48.2
24.9	46.39	30.7	25.2	58.90	60.4	25.4	51.12	66.5	25.7	29.72	38.2	25.7	58.02	48.3
25.9	46.71	30.3	26.2	58.49	60.2	26.4	50.69	66.8	26.7	30.03	38.5	26.7	59.24	48.4
26.9	47.12	30.0	27.2	58.09	60.1	27.4	50.23	67.1	27.7	30.31	38.7	27.7	60.40	48.5
27.9	47.57	29.7	28.2	57.72	59.9	28.4	49.76	67.3	28.7	30.56	39.0	28.7	61.48	48.7
28.9	48.05	29.4	29.2	57.37	59.7	29.4	49.28	67.6	29.6	30.79	39.2	29.7	62.48	48.9
29.9	48.56	29.1	30.2	57.05	59.6	30.4	48.82	67.8	30.6	31.00	39.4	30.7	63.42	49.0
30.9	49.04	28.9	31.2	56.75	59.4	31.4	48.38	68.0	31.6	31.21	39.7	31.7	64.30	49.2
31.9	49.48	28.7	32.2	56.46	59.2	32.4	47.97	68.2	32.6	31.42	39.9	32.7	65.17	49.3

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
May	h m 1 24	° ' +88 48	May	h m 6 56	° ' +87 11	May	h m 12 14	° ' +88 13	May	h m 18 2	° ' +86 36	May	h m 19 15	° ' +88 59
	s	"		s	"		s	"		s	"		s	"
1.9	49.48	28.7	1.2	56.75	59.4	1.4	48.38	8.0	1.6	31.21	39.7	1.7	4.30	49.2
2.9	49.89	28.5	2.2	56.46	59.2	2.4	47.97	8.2	2.6	31.42	39.9	2.7	5.17	49.3
3.9	50.26	28.2	3.2	56.17	59.1	3.4	47.59	8.4	3.6	31.62	40.1	3.7	6.06	49.5
4.9	50.62	28.0	4.2	55.87	59.0	4.4	47.21	8.6	4.6	31.84	40.3	4.7	6.97	49.6
5.9	50.98	27.7	5.2	55.55	58.8	5.4	46.83	8.8	5.6	32.08	40.5	5.7	7.94	49.7
6.9	51.36	27.4	6.2	55.21	58.7	6.4	46.43	9.1	6.6	32.34	40.7	6.7	8.97	49.8
7.9	51.80	27.1	7.2	54.86	58.6	7.4	46.01	9.3	7.6	32.59	40.9	7.7	10.03	50.0
8.9	52.30	26.9	8.2	54.50	58.4	8.4	45.55	9.6	8.6	32.85	41.1	8.7	11.12	50.1
9.9	52.88	26.6	9.2	54.14	58.2	9.4	45.03	9.8	9.6	33.11	41.4	9.7	12.22	50.3
10.9	53.51	26.3	10.2	53.78	58.0	10.4	44.47	10.0	10.6	33.34	41.7	10.7	13.27	50.5
11.9	54.20	26.0	11.2	53.45	57.8	11.4	43.88	10.2	11.6	33.55	42.0	11.7	14.26	50.7
12.9	54.91	25.8	12.2	53.14	57.5	12.4	43.29	10.4	12.6	33.73	42.3	12.7	15.19	51.0
13.9	55.61	25.6	13.1	52.86	57.3	13.4	42.69	10.5	13.6	33.90	42.6	13.7	16.05	51.2
14.9	56.29	25.4	14.1	52.60	57.0	14.4	42.12	10.7	14.6	34.05	42.9	14.7	16.83	51.4
15.9	56.93	25.2	15.1	52.36	56.8	15.4	41.59	10.8	15.6	34.19	43.1	15.7	17.57	51.6
16.9	57.53	25.0	16.1	52.13	56.6	16.4	41.08	10.9	16.6	34.34	43.4	16.7	18.29	51.8
17.9	58.09	24.8	17.1	51.91	56.4	17.4	40.59	11.0	17.6	34.49	43.6	17.7	19.03	52.0
18.9	58.64	24.6	18.1	51.67	56.2	18.4	40.12	11.1	18.6	34.65	43.9	18.7	19.79	52.2
19.9	59.19	24.3	19.1	51.42	56.0	19.4	39.64	11.3	19.6	34.83	44.1	19.6	20.60	52.4
20.9	59.79	24.1	20.1	51.16	55.8	20.4	39.14	11.5	20.6	35.01	44.3	20.6	21.47	52.6
21.9	60.45	23.9	21.1	50.88	55.6	21.3	38.61	11.6	21.6	35.19	44.6	21.6	22.35	52.8
22.9	61.18	23.6	22.1	50.60	55.4	22.3	38.03	11.8	22.6	35.36	44.9	22.6	23.23	53.0
23.9	61.97	23.4	23.1	50.33	55.2	23.3	37.41	12.0	23.6	35.53	45.2	23.6	24.08	53.3
24.9	62.82	23.2	24.1	50.07	54.9	24.3	36.76	12.1	24.6	35.67	45.5	24.6	24.89	53.5
25.9	63.71	23.0	25.1	49.84	54.6	25.3	36.08	12.2	25.6	35.78	45.9	25.6	25.62	53.8
26.9	64.63	22.8	26.1	49.64	54.3	26.3	35.40	12.3	26.6	35.87	46.2	26.6	26.26	54.1
27.9	65.51	22.7	27.1	49.47	54.0	27.3	34.74	12.4	27.6	35.93	46.5	27.6	26.81	54.4
28.9	66.37	22.6	28.1	49.32	53.7	28.3	34.10	12.5	28.6	35.98	46.8	28.6	27.31	54.6
29.9	67.19	22.4	29.1	49.20	53.5	29.3	33.49	12.6	29.6	36.03	47.1	29.6	27.76	54.9
30.9	67.95	22.3	30.1	49.08	53.2	30.3	32.93	12.6	30.6	36.07	47.4	30.6	28.22	55.2
31.9	68.69	22.2	31.1	48.96	53.0	31.3	32.38	12.7	31.6	36.12	47.7	31.6	28.69	55.4
32.9	69.39	22.0	32.1	48.82	52.7	32.3	31.84	12.8	32.6	36.19	47.9	32.6	29.20	55.6

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
June	h m	° '	June	h m	° '	June	h m	° '	June	h m	° '	June	h m	° '
	1 25	+88 48		6 56	+87 11		12 14	+88 13		18 2	+86 36		19 15	+88 59
	s	"		s	"		s	"		s	"		s	"
1.9	9.39	22.0	1.1	48.82	52.7	1.3	31.84	12.8	1.6	36.19	47.9	1.6	29.20	55.6
2.9	10.15	21.9	2.1	48.67	52.5	2.3	31.30	12.9	2.6	36.26	48.2	2.6	29.75	55.9
3.9	10.93	21.7	3.1	48.50	52.3	3.3	30.73	13.0	3.6	36.37	48.5	3.6	30.36	56.1
4.9	11.75	21.5	4.1	48.32	52.0	4.3	30.13	13.1	4.6	36.46	48.8	4.6	30.97	56.4
5.9	12.65	21.4	5.1	48.14	51.7	5.3	29.48	13.2	5.5	36.55	49.1	5.6	31.59	56.6
6.9	13.61	21.2	6.1	47.97	51.4	6.3	28.80	13.2	6.5	36.62	49.5	6.6	32.18	56.9
7.8	14.61	21.1	7.1	47.81	51.1	7.3	28.08	13.3	7.5	36.66	49.8	7.6	32.74	57.2
8.8	15.64	20.9	8.1	47.68	50.8	8.3	27.36	13.3	8.5	36.69	50.2	8.6	33.21	57.6
9.8	16.67	20.8	9.1	47.58	50.5	9.3	26.64	13.3	9.5	36.70	50.5	9.6	33.61	57.9
10.8	17.67	20.7	10.1	47.50	50.2	10.3	25.93	13.3	10.5	36.68	50.8	10.6	33.93	58.2
11.8	18.63	20.7	11.1	47.44	49.9	11.3	25.26	13.3	11.5	36.66	51.2	11.6	34.20	58.5
12.8	19.54	20.6	12.1	47.41	49.6	12.3	24.64	13.3	12.5	36.63	51.5	12.6	34.42	58.8
13.8	20.41	20.5	13.1	47.38	49.3	13.3	24.04	13.2	13.5	36.61	51.8	13.6	34.64	59.1
14.8	21.24	20.5	14.1	47.33	49.0	14.3	23.46	13.2	14.5	36.58	52.0	14.6	34.88	59.4
15.8	22.08	20.4	15.1	47.28	48.8	15.3	22.89	13.2	15.5	36.57	52.3	15.6	35.15	59.6
16.8	22.92	20.3	16.1	47.22	48.5	16.3	22.31	13.2	16.5	36.56	52.6	16.6	35.46	59.9
17.8	23.81	20.2	17.1	47.15	48.3	17.3	21.72	13.2	17.5	36.57	52.9	17.6	35.80	60.2
18.8	24.76	20.1	18.0	47.07	48.0	18.3	21.09	13.2	18.5	36.57	53.2	18.6	36.16	60.5
19.8	25.77	20.0	19.0	46.99	47.7	19.3	20.41	13.2	19.5	36.57	53.5	19.6	36.51	60.8
20.8	26.84	19.9	20.0	46.92	47.4	20.3	19.71	13.2	20.5	36.54	53.8	20.6	36.80	61.1
21.8	27.96	19.9	21.0	46.88	47.0	21.3	18.97	13.2	21.5	36.48	54.2	21.6	37.02	61.4
22.8	29.08	19.8	22.0	46.86	46.7	22.3	18.23	13.2	22.5	36.40	54.6	22.6	37.16	61.8
23.8	30.20	19.8	23.0	46.88	46.3	23.3	17.51	13.1	23.5	36.30	54.9	23.5	37.20	62.1
24.8	31.28	19.8	24.0	46.94	46.0	24.3	16.83	13.0	24.5	36.19	55.2	24.5	37.16	62.5
25.8	32.31	19.8	25.0	47.01	45.7	25.3	16.17	12.9	25.5	36.06	55.5	25.5	37.08	62.8
26.8	33.29	19.9	26.0	47.09	45.4	26.3	15.55	12.8	26.5	35.92	55.8	26.5	36.97	63.1
27.8	34.22	19.9	27.0	47.17	45.1	27.2	14.98	12.7	27.5	35.80	56.1	27.5	36.87	63.4
28.8	35.11	19.9	28.0	47.25	44.8	28.2	14.42	12.7	28.5	35.68	56.4	28.5	36.79	63.7
29.8	36.00	19.9	29.0	47.32	44.5	29.2	13.86	12.6	29.5	35.58	56.6	29.5	36.77	64.0
30.8	36.94	19.9	30.0	47.36	44.3	30.2	13.29	12.5	30.5	35.48	56.9	30.5	36.78	64.3
31.8	37.91	19.8	31.0	47.40	44.0	31.2	12.68	12.5	31.5	35.40	57.2	31.5	36.84	64.6

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (HEV.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
July	h m 1 25	° +88 48	July	h m 6 56	° +87 11	July	h m 12 13	° +88 13	July	h m 18 2	° +86 36	July	h m 19 15	° +89 0
	s	"		s	"		s	"		s	"		s	"
1.8	37.91	19.8	1.0	47.40	44.0	1.2	72.68	12.5	1.5	35.40	57.2	1.5	36.84	4.6
2.8	38.92	19.8	2.0	47.43	43.7	2.2	72.05	12.4	2.5	35.31	57.5	2.5	36.89	4.9
3.8	40.00	19.8	3.0	47.46	43.4	3.2	71.39	12.3	3.5	35.21	57.8	3.5	36.93	5.2
4.8	41.12	19.8	4.0	47.49	43.1	4.2	70.70	12.2	4.5	35.10	58.2	4.5	36.92	5.5
5.8	42.26	19.8	5.0	47.56	42.7	5.2	69.99	12.1	5.5	34.97	58.5	5.5	36.85	5.9
6.8	43.42	19.8	6.0	47.65	42.3	6.2	69.28	12.0	6.5	34.81	58.8	6.5	36.71	6.3
7.8	44.55	19.9	6.9	47.78	42.0	7.2	68.59	11.9	7.5	34.63	59.1	7.5	36.48	6.6
8.8	45.64	20.0	7.9	47.93	41.7	8.2	67.94	11.7	8.5	34.43	59.4	8.5	36.17	7.0
9.8	46.69	20.1	8.9	48.09	41.4	9.2	67.32	11.5	9.5	34.23	59.7	9.5	35.83	7.3
10.8	47.66	20.1	9.9	48.27	41.1	10.2	66.74	11.3	10.5	34.03	60.0	10.5	35.48	7.6
11.8	48.58	20.2	10.9	48.44	40.8	11.2	66.20	11.2	11.5	33.84	60.3	11.5	35.13	7.9
12.8	49.48	20.3	11.9	48.60	40.5	12.2	65.68	11.0	12.4	33.67	60.5	12.5	34.81	8.2
13.8	50.38	20.3	12.9	48.75	40.3	13.2	65.16	10.8	13.4	33.51	60.7	13.5	34.53	8.5
14.8	51.33	20.4	13.9	48.89	40.0	14.2	64.63	10.7	14.4	33.35	61.0	14.5	34.30	8.7
15.7	52.31	20.4	14.9	49.02	39.7	15.2	64.07	10.6	15.4	33.19	61.3	15.5	34.09	9.0
16.7	53.34	20.5	15.9	49.13	39.4	16.2	63.47	10.4	16.4	33.02	61.6	16.5	33.86	9.3
17.7	54.43	20.5	16.9	49.26	39.1	17.2	62.85	10.3	17.4	32.83	61.9	17.5	33.59	9.7
18.7	55.57	20.6	17.9	49.43	38.8	18.2	62.20	10.1	18.4	32.63	62.2	18.5	33.26	10.0
19.7	56.72	20.7	18.9	49.61	38.4	19.2	61.54	9.9	19.4	32.40	62.5	19.5	32.87	10.4
20.7	57.86	20.8	19.9	49.81	38.1	20.2	60.89	9.7	20.4	32.15	62.8	20.5	32.39	10.7
21.7	58.97	21.0	20.9	50.05	37.8	21.2	60.27	9.5	21.4	31.87	63.0	21.5	31.81	11.1
22.7	60.04	21.2	21.9	50.32	37.5	22.2	59.68	9.3	22.4	31.58	63.3	22.5	31.17	11.4
23.7	61.04	21.3	22.9	50.61	37.2	23.2	59.15	9.0	23.4	31.29	63.6	23.5	30.50	11.7
24.7	62.00	21.5	23.9	50.90	36.9	24.2	58.66	8.8	24.4	31.00	63.8	24.5	29.83	12.0
25.7	62.91	21.7	24.9	51.17	36.6	25.2	58.19	8.6	25.4	30.72	64.0	25.5	29.18	12.3
26.7	63.79	21.8	25.9	51.44	36.4	26.2	57.74	8.4	26.4	30.46	64.2	26.5	28.56	12.6
27.7	64.67	22.0	26.9	51.69	36.1	27.2	57.29	8.2	27.4	30.21	64.4	27.5	28.00	12.8
28.7	65.58	22.1	27.9	51.93	35.9	28.2	56.82	8.0	28.4	29.97	64.7	28.5	27.47	13.1
29.7	66.55	22.2	28.9	52.14	35.6	29.2	56.32	7.8	29.4	29.74	64.9	29.5	26.96	13.4
30.7	67.55	22.3	29.9	52.37	35.3	30.2	55.79	7.6	30.4	29.50	65.1	30.5	26.45	13.7
31.7	68.61	22.5	30.9	52.61	35.1	31.2	55.21	7.4	31.4	29.25	65.4	31.4	25.91	14.0
32.7	69.70	22.6	31.9	52.84	34.7	32.1	54.64	7.1	32.4	28.98	65.6	32.4	25.31	14.3

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hæv.).			6 Ursæ Min. (B.).			δ Ursæ Min.			λ Ursæ Min.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.
Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '
	1 26	+88 48		6 56	+87 11		12 13	+88 12		18 2	+86 37		19 14	+89 0
	s	"		s	"		s	"		s	"		s	"
1.7	9.70	22.6	1.9	53.12	34.4	1.1	54.64	67.1	1.4	28.98	5.6	1.4	85.31	14.3
2.7	10.79	22.8	2.9	53.42	34.1	2.1	54.06	66.9	2.4	28.68	5.9	2.4	84.64	14.6
3.7	11.86	23.0	3.9	53.75	33.8	3.1	53.49	66.6	3.4	28.37	6.2	3.4	83.90	15.0
4.7	12.90	23.2	4.9	54.09	33.5	4.1	52.97	66.3	4.4	28.04	6.4	4.4	83.08	15.3
5.7	13.87	23.4	5.9	54.45	33.3	5.1	52.48	66.0	5.4	27.70	6.6	5.4	82.20	15.6
6.7	14.77	23.6	6.9	54.81	33.0	6.1	52.04	65.7	6.4	27.35	6.8	6.4	81.30	15.9
7.7	15.63	23.9	7.9	55.15	32.8	7.1	51.63	65.4	7.4	27.03	7.0	7.4	80.41	16.1
8.7	16.44	24.1	8.9	55.48	32.6	8.1	51.26	65.1	8.4	26.71	7.2	8.4	79.55	16.4
9.7	17.24	24.3	9.9	55.80	32.4	9.1	50.90	64.8	9.4	26.40	7.3	9.4	78.72	16.6
10.7	18.04	24.5	10.9	56.10	32.2	10.1	50.52	64.5	10.4	26.11	7.5	10.4	77.94	16.9
11.7	18.88	24.7	11.9	56.40	31.9	11.1	50.14	64.3	11.4	25.82	7.7	11.4	77.20	17.1
12.7	19.76	24.8	12.9	56.70	31.7	12.1	49.72	64.0	12.4	25.52	7.9	12.4	76.46	17.4
13.7	20.70	25.0	13.9	57.01	31.4	13.1	49.28	63.7	13.4	25.21	8.1	13.4	75.69	17.7
14.7	21.68	25.2	14.9	57.35	31.2	14.1	48.82	63.5	14.4	24.88	8.3	14.4	74.87	17.9
15.7	22.69	25.4	15.9	57.72	30.9	15.1	48.33	63.2	15.4	24.54	8.5	15.4	73.99	18.2
16.7	23.69	25.7	16.9	58.13	30.6	16.1	47.86	62.9	16.4	24.17	8.7	16.4	73.03	18.5
17.7	24.67	25.9	17.9	58.56	30.3	17.1	47.41	62.5	17.3	23.79	8.9	17.4	71.99	18.8
18.7	25.61	26.2	18.9	59.00	30.1	18.1	47.00	62.2	18.3	23.38	9.1	18.4	70.88	19.1
19.6	26.48	26.5	19.9	59.45	29.9	19.1	46.64	61.9	19.3	22.97	9.2	19.4	69.72	19.4
20.6	27.27	26.8	20.9	59.90	29.7	20.1	46.30	61.5	20.3	22.57	9.4	20.4	68.56	19.6
21.6	28.00	27.1	21.9	60.33	29.5	21.1	46.02	61.2	21.3	22.17	9.5	21.4	67.41	19.8
22.6	28.69	27.4	22.9	60.74	29.3	22.1	45.76	60.8	22.3	21.79	9.6	22.4	66.30	20.0
23.6	29.39	27.7	23.9	61.14	29.2	23.1	45.51	60.5	23.3	21.42	9.7	23.4	65.23	20.2
24.6	30.11	27.9	24.9	61.52	29.0	24.1	45.26	60.2	24.3	21.06	9.8	24.4	64.21	20.5
25.6	30.85	28.2	25.9	61.90	28.8	25.1	44.99	59.9	25.3	20.72	9.9	25.4	63.22	20.7
26.6	31.63	28.4	26.9	62.27	28.6	26.1	44.68	59.6	26.3	20.38	10.1	26.4	62.25	20.9
27.6	32.46	28.7	27.9	62.66	28.3	27.1	44.34	59.3	27.3	20.02	10.2	27.4	61.27	21.1
28.6	33.31	28.9	28.9	63.07	28.1	28.1	43.98	59.0	28.3	19.65	10.4	28.4	60.25	21.4
29.6	34.18	29.2	29.9	63.51	27.9	29.1	43.61	58.7	29.3	19.27	10.6	29.4	59.17	21.6
30.6	35.06	29.5	30.8	63.97	27.7	30.1	43.26	58.3	30.3	18.86	10.7	30.4	58.01	21.9
31.6	35.88	29.8	31.8	64.43	27.5	31.1	42.94	57.9	31.3	18.44	10.8	31.4	56.78	22.1
32.6	36.64	30.1	32.8	64.92	27.3	32.1	42.67	57.5	32.3	18.00	11.0	32.4	55.50	22.4

**CIRCUMPOLAR STARS.**

**APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.**

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '
	1 26	+88 48		6 57	+87 11		12 13	+88 12		18 2	+86 37		19 14	+89 0
	s	"		s	"		s	"		s	"		s	"
1.6	36.64	30.1	1.8	4.92	27.3	1.1	42.67	57.5	1.3	18.00	11.0	1.4	55.50	22.4
2.6	37.34	30.5	2.8	5.42	27.1	2.1	42.43	57.1	2.3	17.57	11.1	2.4	54.19	22.6
3.6	37.96	30.8	3.8	5.91	27.0	3.1	42.25	56.8	3.3	17.15	11.1	3.4	52.88	22.8
4.6	38.54	31.1	4.8	6.38	26.8	4.1	42.11	56.4	4.3	16.73	11.2	4.4	51.59	22.9
5.6	39.07	31.4	5.8	6.83	26.7	5.1	41.96	56.0	5.3	16.33	11.2	5.3	50.34	23.1
6.6	39.61	31.7	6.8	7.27	26.6	6.0	41.82	55.6	6.3	15.95	11.3	6.3	49.15	23.2
7.6	40.17	32.0	7.8	7.69	26.4	7.0	41.68	55.3	7.3	15.58	11.3	7.3	47.99	23.4
8.6	40.77	32.3	8.8	8.10	26.3	8.0	41.52	55.0	8.3	15.21	11.4	8.3	46.86	23.6
9.6	41.42	32.6	9.8	8.53	26.1	9.0	41.32	54.6	9.3	14.84	11.5	9.3	45.74	23.7
10.6	42.12	32.9	10.8	9.00	26.0	10.0	41.10	54.3	10.3	14.45	11.6	10.3	44.57	23.9
11.6	42.83	33.2	11.8	9.47	25.8	11.0	40.86	54.0	11.3	14.04	11.7	11.3	43.34	24.1
12.6	43.56	33.5	12.8	9.97	25.6	12.0	40.63	53.6	12.3	13.60	11.7	12.3	42.05	24.4
13.6	44.26	33.9	13.8	10.50	25.4	13.0	40.41	53.2	13.3	13.15	11.8	13.3	40.67	24.5
14.6	44.91	34.3	14.8	11.04	25.3	14.0	40.23	52.8	14.3	12.69	11.9	14.3	39.22	24.7
15.6	45.50	34.7	15.8	11.59	25.2	15.0	40.09	52.4	15.3	12.22	11.9	15.3	37.73	24.9
16.6	46.01	35.0	16.8	12.14	25.1	16.0	40.01	52.0	16.3	11.75	11.9	16.3	36.23	25.0
17.6	46.47	35.4	17.8	12.68	25.0	17.0	39.98	51.6	17.3	11.29	11.9	17.3	34.75	25.2
18.6	46.88	35.8	18.8	13.20	24.9	18.0	39.97	51.2	18.3	10.85	11.9	18.3	33.29	25.3
19.6	47.25	36.2	19.8	13.71	24.8	19.0	39.97	50.8	19.3	10.43	11.9	19.3	31.87	25.4
20.6	47.63	36.5	20.8	14.19	24.8	20.0	39.97	50.5	20.3	10.01	11.9	20.3	30.52	25.5
21.6	48.04	36.8	21.8	14.65	24.7	21.0	39.96	50.1	21.3	9.61	11.9	21.3	29.22	25.6
22.6	48.47	37.1	22.8	15.12	24.6	22.0	39.94	49.8	22.3	9.22	11.9	22.3	27.96	25.7
23.6	48.95	37.5	23.8	15.59	24.5	23.0	39.88	49.4	23.2	8.83	11.9	23.3	26.69	25.8
24.6	49.46	37.8	24.8	16.07	24.4	24.0	39.80	49.1	24.2	8.42	11.9	24.3	25.40	25.9
25.5	50.00	38.1	25.8	16.58	24.3	25.0	39.70	48.7	25.2	8.09	12.0	25.3	24.06	26.1
26.5	50.53	38.5	26.8	17.11	24.2	25.9	39.61	48.3	26.2	7.58	12.0	26.3	22.66	26.2
27.5	51.01	38.9	27.8	17.66	24.1	26.9	39.53	47.9	27.2	7.13	12.0	27.3	21.19	26.3
28.5	51.44	39.3	28.8	18.21	24.0	27.9	39.50	47.5	28.2	6.66	12.0	28.3	19.67	26.4
29.5	51.81	39.7	29.8	18.77	23.9	28.9	39.53	47.0	29.2	6.19	11.9	29.3	18.11	26.5
30.5	52.10	40.1	30.8	19.34	23.9	29.9	39.60	46.6	30.2	5.74	11.9	30.3	16.55	26.6
31.5	52.33	40.5	31.8	19.89	23.9	30.9	39.71	46.2	31.2	5.30	11.8	31.3	15.02	26.7
32.5	52.51	40.9	32.8	20.42	23.8	31.9	39.85	45.8	32.2	4.87	11.7	32.3	13.55	26.7

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hev.).			6 Ursæ Min. (B.).			δ Ursæ Min.			λ Ursæ Min.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.
Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '
	1 26	+88 48		6 57	+87 11		12 13	+88 12		18 1	+86 37		19 13	+89 0
	s	"		s	"		s	"		s	"		s	"
1.5	52.33	40.5	1.8	19.89	23.9	1.9	39.85	45.8	1.2	65.30	11.8	1.3	75.02	26.7
2.5	52.51	40.9	2.8	20.42	23.8	2.9	40.00	45.4	2.2	64.87	11.7	2.3	73.55	26.7
3.5	52.68	41.2	3.8	20.92	23.8	3.9	40.15	45.1	3.2	64.47	11.6	3.3	72.12	26.8
4.5	52.85	41.6	4.8	21.41	23.8	4.9	40.29	44.7	4.2	64.09	11.5	4.3	70.74	26.8
5.5	53.06	41.9	5.8	21.89	23.8	5.9	40.38	44.3	5.2	63.71	11.5	5.3	69.40	26.8
6.5	53.32	42.3	6.8	22.35	23.8	6.9	40.44	44.0	6.2	63.32	11.4	6.3	68.08	26.9
7.5	53.61	42.6	7.7	22.84	23.7	7.9	40.49	43.6	7.2	62.92	11.4	7.3	66.74	26.9
8.5	53.92	43.0	8.7	23.36	23.7	8.9	40.55	43.3	8.2	62.52	11.3	8.3	65.36	27.0
9.5	54.27	43.3	9.7	23.89	23.6	9.9	40.61	42.9	9.2	62.10	11.3	9.3	63.93	27.1
10.5	54.59	43.7	10.7	24.44	23.6	10.9	40.70	42.5	10.2	61.66	11.2	10.3	62.44	27.2
11.5	54.86	44.1	11.7	25.01	23.5	11.9	40.83	42.1	11.2	61.19	11.2	11.2	60.87	27.2
12.5	55.08	44.5	12.7	25.60	23.5	12.9	41.00	41.6	12.2	60.72	11.1	12.2	59.23	27.3
13.5	55.23	45.0	13.7	26.19	23.5	13.9	41.23	41.2	13.2	60.25	11.0	13.2	57.58	27.3
14.5	55.30	45.4	14.7	26.77	23.6	14.9	41.49	40.8	14.2	59.80	10.9	14.2	55.96	27.3
15.5	55.32	45.8	15.7	27.32	23.6	15.9	41.77	40.5	15.2	59.37	10.7	15.2	54.36	27.3
16.5	55.29	46.2	16.7	27.87	23.7	16.9	42.06	40.1	16.2	58.95	10.6	16.2	52.82	27.3
17.5	55.26	46.6	17.7	28.38	23.8	17.9	42.35	39.8	17.2	58.56	10.4	17.2	51.34	27.2
18.5	55.24	47.0	18.7	28.87	23.8	18.9	42.61	39.4	18.2	58.18	10.2	18.2	49.94	27.2
19.5	55.24	47.3	19.7	29.34	23.9	19.9	42.84	39.1	19.2	57.82	10.1	19.2	48.57	27.2
20.5	55.29	47.7	20.7	29.83	23.9	20.9	43.05	38.8	20.2	57.46	10.0	20.2	47.23	27.1
21.5	55.38	48.0	21.7	30.32	23.9	21.9	43.24	38.4	21.2	57.09	9.9	21.2	45.88	27.1
22.5	55.49	48.4	22.7	30.82	23.9	22.9	43.44	38.1	22.2	56.70	9.8	22.2	44.51	27.1
23.5	55.58	48.7	23.7	31.34	23.9	23.9	43.65	37.7	23.2	56.30	9.7	23.2	43.07	27.1
24.5	55.66	49.1	24.7	31.88	24.0	24.9	43.89	37.3	24.2	55.89	9.6	24.2	41.59	27.1
25.5	55.68	49.5	25.7	32.44	24.0	25.9	44.17	36.9	25.2	55.47	9.4	25.2	40.06	27.1
26.5	55.65	50.0	26.7	33.02	24.1	26.9	44.51	36.5	26.2	55.04	9.3	26.2	38.49	27.1
27.5	55.53	50.4	27.7	33.57	24.2	27.9	44.89	36.1	27.2	54.63	9.1	27.2	36.91	27.1
28.5	55.34	50.8	28.7	34.11	24.3	28.9	45.31	35.7	28.2	54.22	8.9	28.2	35.36	27.0
29.5	55.10	51.2	29.7	34.63	24.4	29.9	45.74	35.4	29.1	53.84	8.7	29.2	33.84	26.9
30.5	54.82	51.6	30.7	35.13	24.5	30.9	46.16	35.0	30.1	53.48	8.4	30.2	32.39	26.8
31.5	54.54	51.9	31.7	35.60	24.6	31.9	46.58	34.7	31.1	53.14	8.2	31.2	31.01	26.7
32.4	54.29	52.3	32.7	36.06	24.8	32.9	46.97	34.4	32.1	52.82	8.0	32.2	29.69	26.6

**CIRCUMPOLAR STARS.**

**APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.**

a Ursæ Min. (Polaris).			51 Cephei (Hév.).			6 Ursæ Min. (B.).			δ Ursæ Min.			λ Ursæ Min.		
Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.	Mean Solar Date.	Right Ascen- sion.	Declina- tion North.
Nov.	h m	°	Nov.	h m	°	Nov.	h m	°	Nov.	h m	°	Nov.	h m	°
	1 26	+88 48		6 57	+87 11		12 13	+88 12		18 1	+86 37		19 12	+89 0
	s	"		s	"		s	"		s	"		s	"
1.4	54.29	52.3	1.7	36.06	24.8	1.9	46.97	34.4	1.1	52.82	8.0	1.2	89.69	26.6
2.4	54.07	52.6	2.7	36.50	24.9	2.9	47.32	34.1	2.1	52.51	7.8	2.2	88.41	26.5
3.4	53.90	52.9	3.7	36.95	25.0	3.9	47.67	33.8	3.1	52.19	7.6	3.2	87.13	26.4
4.4	53.76	53.3	4.7	37.43	25.0	4.9	48.00	33.4	4.1	51.85	7.4	4.2	85.84	26.3
5.4	53.64	53.6	5.7	37.92	25.1	5.9	48.34	33.1	5.1	51.51	7.3	5.2	84.50	26.3
6.4	53.51	54.0	6.7	38.42	25.2	6.9	48.70	32.8	6.1	51.15	7.1	6.2	83.11	26.2
7.4	53.35	54.4	7.7	38.95	25.3	7.9	49.09	32.4	7.1	50.77	6.9	7.2	81.65	26.1
8.4	53.14	54.8	8.7	39.50	25.4	8.9	49.52	32.1	8.1	50.39	6.7	8.2	80.15	26.0
9.4	52.86	55.2	9.7	40.03	25.6	9.9	50.00	31.7	9.1	50.00	6.5	9.2	78.62	25.9
10.4	52.51	55.6	10.7	40.56	25.7	10.9	50.53	31.4	10.1	49.62	6.2	10.2	77.10	25.8
11.4	52.09	56.0	11.6	41.07	25.9	11.9	51.08	31.1	11.1	49.27	6.0	11.2	75.62	25.7
12.4	51.61	56.4	12.6	41.56	26.1	12.9	51.64	30.8	12.1	48.93	5.7	12.2	74.20	25.5
13.4	51.12	56.7	13.6	42.02	26.3	13.9	52.20	30.5	13.1	48.61	5.4	13.2	72.85	25.3
14.4	50.63	57.1	14.6	42.45	26.5	14.9	52.74	30.3	14.1	48.32	5.1	14.2	71.57	25.1
15.4	50.18	57.4	15.6	42.86	26.7	15.9	53.25	30.0	15.1	48.04	4.9	15.2	70.35	25.0
16.4	49.74	57.7	16.6	43.27	26.8	16.9	53.74	29.8	16.1	47.77	4.6	16.2	69.16	24.8
17.4	49.35	58.0	17.6	43.68	27.0	17.9	54.21	29.5	17.1	47.51	4.4	17.1	68.00	24.6
18.4	48.98	58.3	18.6	44.10	27.1	18.9	54.65	29.2	18.1	47.24	4.1	18.1	66.83	24.5
19.4	48.63	58.6	19.6	44.53	27.3	19.8	55.11	28.9	19.1	46.95	3.9	19.1	65.63	24.4
20.4	48.26	59.0	20.6	44.99	27.4	20.8	55.59	28.6	20.1	46.66	3.7	20.1	64.39	24.2
21.4	47.86	59.3	21.6	45.45	27.6	21.8	56.11	28.3	21.1	46.35	3.4	21.1	63.09	24.1
22.4	47.40	59.7	22.6	45.91	27.8	22.8	56.68	28.0	22.1	46.04	3.2	22.1	61.77	23.9
23.4	46.87	60.0	23.6	46.38	28.0	23.8	57.29	27.7	23.1	45.74	2.9	23.1	60.43	23.7
24.4	46.25	60.4	24.6	46.83	28.2	24.8	57.94	27.4	24.1	45.46	2.6	24.1	59.13	23.5
25.4	45.56	60.7	25.6	47.25	28.5	25.8	58.61	27.2	25.1	45.20	2.2	25.1	57.87	23.3
26.4	44.85	61.0	26.6	47.65	28.7	26.8	59.28	26.9	26.1	44.95	1.9	26.1	56.68	23.1
27.4	44.12	61.3	27.6	48.02	29.0	27.8	59.96	26.7	27.1	44.73	1.6	27.1	55.56	22.8
28.4	43.42	61.6	28.6	48.38	29.3	28.8	60.60	26.5	28.1	44.52	1.2	28.1	54.52	22.6
29.4	42.73	61.9	29.6	48.72	29.5	29.8	61.20	26.3	29.1	44.34	0.9	29.1	53.52	22.3
30.4	42.08	62.1	30.6	49.04	29.7	30.8	61.78	26.1	30.1	44.15	0.6	30.1	52.56	22.1
31.4	41.49	62.4	31.6	49.39	29.9	31.8	62.34	25.9	31.1	43.96	0.4	31.1	51.60	21.9



CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Dec.	h m 1 26	° ' " +88 49	Dec.	h m 6 57	° ' " +87 11	Dec.	h m 12 14	° ' " +88 12	Dec.	h m 18 1	° ' " +86 36	Dec.	h m 19 12	° ' " +89 0
	s	"		s	"		s	"		s	"		s	"
1.4	41.49	2.4	1.6	49.39	29.9	1.8	2.34	25.9	1.1	43.96	60.4	1.1	51.60	21.9
2.4	40.92	2.7	2.6	49.74	30.1	2.8	2.89	25.7	2.1	43.77	60.1	2.1	50.62	21.7
3.4	40.36	3.0	3.6	50.11	30.3	3.8	3.45	25.5	3.1	43.56	59.8	3.1	49.60	21.5
4.4	39.79	3.3	4.6	50.50	30.5	4.8	4.04	25.2	4.0	43.33	59.5	4.1	48.54	21.3
5.4	39.16	3.6	5.6	50.90	30.8	5.8	4.66	25.0	5.0	43.09	59.2	5.1	47.41	21.1
6.4	38.48	3.9	6.6	51.30	31.0	6.8	5.34	24.8	6.0	42.85	59.0	6.1	46.24	20.8
7.3	37.72	4.2	7.6	51.69	31.3	7.8	6.06	24.6	7.0	42.63	58.6	7.1	45.10	20.6
8.3	36.89	4.5	8.6	52.06	31.6	8.8	6.80	24.4	8.0	42.42	58.2	8.1	44.00	20.3
9.3	36.02	4.8	9.6	52.41	31.9	9.8	7.56	24.2	9.0	42.22	57.9	9.1	42.94	20.0
10.3	35.12	5.0	10.6	52.73	32.2	10.8	8.32	24.1	10.0	42.06	57.5	10.1	41.96	19.7
11.3	34.20	5.3	11.6	53.03	32.5	11.8	9.07	23.9	11.0	41.92	57.1	11.1	41.07	19.4
12.3	33.31	5.5	12.6	53.29	32.8	12.8	9.78	23.8	12.0	41.80	56.8	12.1	40.25	19.1
13.3	32.47	5.7	13.6	53.52	33.1	13.8	10.46	23.7	13.0	41.69	56.4	13.1	39.50	18.9
14.3	31.66	5.9	14.6	53.76	33.4	14.8	11.10	23.6	14.0	41.60	56.1	14.1	38.78	18.6
15.3	30.89	6.1	15.6	54.01	33.6	15.8	11.72	23.5	15.0	41.50	55.8	15.1	38.07	18.3
16.3	30.14	6.3	16.6	54.27	33.8	16.8	12.34	23.3	16.0	41.39	55.5	16.1	37.34	18.1
17.3	29.39	6.5	17.6	54.54	34.1	17.8	12.98	23.2	17.0	41.27	55.2	17.1	36.58	17.8
18.3	28.62	6.8	18.6	54.82	34.4	18.8	13.65	23.0	18.0	41.15	54.9	18.1	35.79	17.6
19.3	27.80	7.0	19.5	55.11	34.6	19.8	14.35	22.9	19.0	41.01	54.6	19.1	34.97	17.3
20.3	26.90	7.2	20.5	55.40	34.9	20.8	15.10	22.7	20.0	40.88	54.2	20.1	34.13	17.0
21.3	25.94	7.5	21.5	55.67	35.3	21.8	15.88	22.6	21.0	40.76	53.8	21.1	33.31	16.7
22.3	24.93	7.7	22.5	55.91	35.6	22.8	16.69	22.5	22.0	40.67	53.5	22.1	32.54	16.4
23.3	23.88	7.9	23.5	56.13	36.0	23.8	17.50	22.4	22.9	40.60	53.1	23.0	31.84	16.1
24.3	22.80	8.1	24.5	56.32	36.3	24.8	18.30	22.3	23.9	40.55	52.7	24.0	31.22	15.7
25.3	21.73	8.2	25.5	56.48	36.6	25.7	19.08	22.2	24.9	40.53	52.3	25.0	30.69	15.4
26.3	20.69	8.3	26.5	56.62	37.0	26.7	19.81	22.2	25.9	40.53	51.9	26.0	30.22	15.0
27.3	19.70	8.5	27.5	56.75	37.3	27.7	20.51	22.2	26.9	40.53	51.6	27.0	29.80	14.7
28.3	18.76	8.6	28.5	56.87	37.6	28.7	21.19	22.1	27.9	40.53	51.2	28.0	29.41	14.4
29.3	17.86	8.7	29.5	57.01	37.9	29.7	21.85	22.1	28.9	40.52	50.9	29.0	29.01	14.1
30.3	16.99	8.8	30.5	57.17	38.1	30.7	22.51	22.0	29.9	40.51	50.6	30.0	28.58	13.8
31.3	16.13	9.0	31.5	57.34	38.4	31.7	23.18	22.0	30.9	40.49	50.3	31.0	28.11	13.5
32.3	15.22	9.1	32.5	57.52	38.7	32.7	23.88	21.9	31.9	40.45	50.0	32.0	27.59	13.2

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	43 Cephei (H.).		$\mu$ Hydri.		47 Cephei (H.).		$\delta$ Mensæ.		Groombridge 944.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 0 55	° ' " +85 45	h m 2 33	° ' " -79 30	h m 2 53	° ' " +79 2	h m 4 24	° ' " -80 25	h m 5 31	° ' " +85 8
Jan. 0.4	58.09 2.92	44.3 0.5	39.82 1.13	80.5 0.9	44.55 0.82	75.5 1.9	21.70 0.97	74.7 2.3	76.09 0.41	66.5 3.2
10.3	55.17 2.93	44.8 0.2	38.69 1.20	81.4 0.9	43.73 0.94	77.4 1.3	20.73 1.15	77.0 1.9	75.68 0.91	69.7 2.9
20.3	52.24 2.84	44.6 0.8	37.49 1.22	81.6 0.3	42.79 1.03	78.7 0.7	19.58 1.28	78.9 1.3	74.77 1.36	72.6 2.7
30.3	49.40 2.64	43.8 1.4	36.27 1.21	81.3 0.9	41.76 1.07	79.4 0.2	18.30 1.38	80.2 0.8	73.41 1.76	75.3 2.3
Feb. 9.2	46.76 2.35	42.4 1.9	35.06 1.17	80.4 1.5	40.69 1.08	79.6 0.5	16.92 1.44	81.0 0.3	71.65 2.09	77.6 1.7
19.2	44.41 1.96	40.5 2.4	33.89 1.10	78.9 2.0	39.61 1.03	79.1 1.1	15.48 1.47	81.3 0.3	69.56 2.32	79.3 1.2
Mar. 1.2	42.45 1.49	38.1 2.8	32.79 1.00	76.9 2.5	38.58 0.95	78.0 1.5	14.01 1.45	81.0 0.9	67.24 2.45	80.5 0.6
11.2	40.06 0.98	35.3 3.0	31.79 0.88	74.4 2.8	37.63 0.81	76.5 2.1	12.56 1.39	80.1 1.4	64.79 2.48	81.1 0.0
21.1	39.98 0.42	32.3 3.1	30.91 0.73	71.6 3.2	36.82 0.65	74.4 2.4	11.17 1.30	78.7 1.9	62.31 2.40	81.1 0.6
31.1	39.56 0.14	29.2 3.1	30.18 0.56	68.4 3.5	36.17 0.46	72.0 2.6	9.87 1.19	76.8 2.3	59.91 2.22	80.5 1.2
Apr. 10.1	39.70 0.68	26.1 2.9	29.62 0.38	64.9 3.6	35.71 0.25	69.4 2.8	8.68 1.04	74.5 2.7	57.69 1.97	79.3 1.7
20.1	40.38 1.20	23.2 2.7	29.24 0.20	61.3 3.8	35.46 0.30	66.6 2.8	7.64 0.86	71.8 3.0	55.72 1.63	77.6 2.1
30.0	41.58 1.66	20.5 2.4	29.04 0.01	57.5 3.7	35.43 0.19	63.8 2.8	6.78 0.67	68.8 3.3	54.09 1.24	75.5 2.4
May 10.0	43.24 2.07	18.1 2.0	29.05 0.20	53.8 3.7	35.62 0.39	61.0 2.6	6.11 0.47	65.5 3.4	52.85 0.80	73.1 2.7
20.0	45.31 2.40	16.1 1.5	29.25 0.39	50.1 3.6	36.01 0.60	58.4 2.4	5.64 0.24	62.1 3.5	52.05 0.35	70.4 2.8
29.9	47.71 2.65	14.6 1.0	29.64 0.58	46.5 3.3	36.61 0.78	56.0 2.0	5.40 0.02	58.6 3.5	51.70 0.11	67.6 3.0
June 8.9	50.36 2.83	13.6 0.4	30.22 0.74	43.2 3.0	37.39 0.93	54.0 1.7	5.38 0.21	55.1 3.5	51.81 0.57	64.6 2.9
18.9	53.19 2.92	13.2 0.1	30.06 0.90	40.2 2.7	38.32 1.06	52.3 1.2	5.59 0.42	51.6 3.4	52.38 1.01	61.7 2.7
28.9	56.11 2.93	13.3 0.7	31.86 1.03	37.5 2.2	39.38 1.16	51.1 0.7	6.01 0.63	48.2 3.1	53.39 1.43	59.0 2.6
July 8.8	59.04 2.88	14.0 1.2	32.89 1.12	35.3 1.7	40.54 1.24	50.4 0.3	6.64 0.82	45.1 2.7	54.82 1.81	56.4 2.4
18.8	61.92 2.74	15.2 1.8	34.01 1.19	33.6 1.1	41.78 1.27	50.1 0.3	7.46 0.98	42.4 2.4	56.63 2.14	54.0 2.0
28.8	64.66 2.55	17.0 2.2	35.20 1.22	32.5 0.6	43.05 1.29	50.4 0.7	8.44 1.12	40.0 1.9	58.77 2.43	52.0 1.7
Aug. 7.8	67.21 2.31	19.2 2.6	36.42 1.22	31.9 0.1	44.34 1.27	51.1 1.2	9.56 1.23	38.1 1.4	61.20 2.67	50.3 1.3
17.7	69.52 2.02	21.8 3.0	37.64 1.17	32.0 0.7	45.61 1.24	52.3 1.6	10.79 1.29	36.7 0.8	63.87 2.85	49.0 0.9
27.7	71.54 1.68	24.8 3.3	38.81 1.09	32.7 1.2	46.85 1.17	53.9 2.0	12.08 1.31	35.9 0.2	66.72 2.97	48.1 0.5
Sept. 6.7	73.22 1.31	28.1 3.5	39.90 0.97	33.9 1.8	48.02 1.09	55.9 2.4	13.39 1.29	35.7 0.5	69.69 3.05	47.6 0.0
16.6	74.53 0.91	31.6 3.7	40.87 0.82	35.7 2.3	49.11 0.98	58.3 2.8	14.68 1.23	36.2 1.0	72.74 3.06	47.6 0.5
26.6	75.44 0.48	35.3 3.9	41.69 0.65	38.0 2.6	50.09 0.86	61.1 3.0	15.91 1.13	37.2 1.7	75.80 3.00	48.1 0.9
Oct. 6.6	75.92 0.05	39.2 3.8	42.34 0.45	40.6 3.0	50.95 0.71	64.1 3.3	17.04 0.98	38.9 2.2	78.80 2.90	49.0 1.4
16.6	75.97 0.40	43.0 3.7	42.79 0.23	43.6 3.2	51.66 0.56	67.4 3.4	18.02 0.80	41.1 2.6	81.70 2.72	50.4 1.8
26.5	75.57 0.86	46.7 3.6	43.02 0.00	46.8 3.2	52.22 0.39	70.8 3.4	18.82 0.59	43.7 3.0	84.42 2.48	52.2 2.2
Nov. 5.5	74.71 1.29	50.3 3.4	43.02 0.22	50.0 3.2	52.61 0.21	74.2 3.5	19.41 0.35	46.7 3.2	86.90 2.18	54.4 2.5
15.5	73.42 1.71	53.7 3.0	42.80 0.43	53.2 3.0	52.82 0.01	77.7 3.4	19.76 0.11	49.9 3.3	89.08 1.82	56.9 2.9
25.5	71.71 2.08	56.7 2.6	42.37 0.63	56.2 2.6	52.83 0.18	81.1 3.2	19.87 0.15	53.2 3.3	90.90 1.40	59.8 3.1
Dec. 5.4	69.63 2.42	59.3 2.1	41.74 0.80	58.8 2.3	52.65 0.37	84.3 3.0	19.72 0.40	56.5 3.1	92.30 0.94	62.9 3.3
15.4	67.21 2.68	61.4 1.5	40.94 0.96	61.1 1.8	52.28 0.55	87.3 2.7	19.32 0.63	59.6 2.9	93.24 0.45	66.2 3.3
25.4	64.53 2.85	62.9 0.9	39.98 1.07	62.9 1.2	51.73 0.72	90.0 2.2	18.69 0.85	62.5 2.6	93.69 0.07	69.5 3.3
35.3	61.68	63.8	38.91	64.1	51.01	92.2	17.84	65.1	93.62	72.8

# FIXED STARS, 1907.

(CONSTANTS OF PARIS CONFERENCE.)

553

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Mensæ.		25 Camelop. (H.)		1 Draconis (H.).		ζ Chamæleontis.		δ Chamæleontis.	
	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	h m 6 47	° 80 42	h m 7 11	° 82 35	h m 9 23	° 81 43	h m 9 36	° 80 31	h m 10 44	° 80 2
Jan. 0.6	58.20 s	61.3 "	39.82 s	26.1 "	56.03 s	65.0 "	46.87 s	9.3 "	60.56 s	37.7 "
10.6	57.92 <sup>0.28</sup>	64.8 <sup>3.5</sup>	40.34 <sup>0.52</sup>	29.2 <sup>3.1</sup>	57.28 <sup>1.25</sup>	67.1 <sup>2.1</sup>	47.60 <sup>0.73</sup>	12.5 <sup>3.2</sup>	61.58 <sup>1.02</sup>	40.4 <sup>2.7</sup>
20.5	57.38 <sup>0.54</sup>	68.1 <sup>3.3</sup>	40.51 <sup>0.17</sup>	32.4 <sup>3.2</sup>	58.28 <sup>1.00</sup>	69.6 <sup>2.5</sup>	48.10 <sup>0.50</sup>	16.1 <sup>3.6</sup>	62.43 <sup>0.85</sup>	43.6 <sup>3.2</sup>
30.5	56.61 <sup>0.77</sup>	71.2 <sup>2.8</sup>	40.34 <sup>0.52</sup>	35.5 <sup>3.1</sup>	59.00 <sup>0.72</sup>	72.5 <sup>2.9</sup>	48.37 <sup>0.23</sup>	19.9 <sup>3.8</sup>	63.09 <sup>0.66</sup>	47.1 <sup>3.5</sup>
Feb. 9.5	55.63 <sup>1.17</sup>	74.0 <sup>2.4</sup>	39.82 <sup>0.82</sup>	38.4 <sup>2.7</sup>	59.42 <sup>0.10</sup>	75.5 <sup>3.1</sup>	48.40 <sup>0.21</sup>	23.7 <sup>3.8</sup>	63.54 <sup>0.24</sup>	50.8 <sup>3.8</sup>
19.5	54.46 <sup>1.32</sup>	76.4 <sup>2.0</sup>	39.00 <sup>1.09</sup>	41.1 <sup>2.3</sup>	59.52 <sup>0.20</sup>	78.6 <sup>3.1</sup>	48.19 <sup>0.43</sup>	27.5 <sup>3.7</sup>	63.78 <sup>0.02</sup>	54.6 <sup>3.9</sup>
Mar. 1.4	53.14 <sup>1.42</sup>	78.4 <sup>1.4</sup>	37.91 <sup>1.30</sup>	43.4 <sup>1.8</sup>	59.32 <sup>0.49</sup>	81.7 <sup>3.0</sup>	47.76 <sup>0.63</sup>	31.2 <sup>3.5</sup>	63.80 <sup>0.18</sup>	58.5 <sup>3.8</sup>
11.4	51.72 <sup>1.50</sup>	79.8 <sup>1.0</sup>	36.61 <sup>1.45</sup>	45.2 <sup>1.3</sup>	58.83 <sup>0.74</sup>	84.7 <sup>2.6</sup>	47.13 <sup>0.81</sup>	34.7 <sup>3.2</sup>	63.62 <sup>0.37</sup>	62.3 <sup>3.7</sup>
21.4	50.22 <sup>1.53</sup>	80.8 <sup>0.5</sup>	35.16 <sup>1.54</sup>	46.5 <sup>0.7</sup>	58.09 <sup>0.96</sup>	87.3 <sup>2.3</sup>	46.32 <sup>0.97</sup>	37.9 <sup>2.8</sup>	63.25 <sup>0.55</sup>	66.0 <sup>3.5</sup>
31.3	48.69 <sup>1.53</sup>	81.3 <sup>0.1</sup>	33.62 <sup>1.57</sup>	47.2 <sup>0.2</sup>	57.13 <sup>1.13</sup>	89.6 <sup>1.8</sup>	45.35 <sup>1.11</sup>	40.7 <sup>2.5</sup>	62.70 <sup>0.71</sup>	69.5 <sup>3.2</sup>
Apr. 10.3	47.16 <sup>1.49</sup>	81.2 <sup>0.6</sup>	32.05 <sup>1.52</sup>	47.4 <sup>0.4</sup>	56.00 <sup>1.25</sup>	91.4 <sup>1.3</sup>	44.24 <sup>1.21</sup>	43.2 <sup>2.0</sup>	61.99 <sup>0.85</sup>	72.7 <sup>2.8</sup>
20.3	45.67 <sup>1.41</sup>	80.6 <sup>1.1</sup>	30.53 <sup>1.41</sup>	47.0 <sup>1.0</sup>	54.75 <sup>1.32</sup>	92.7 <sup>0.8</sup>	43.03 <sup>1.27</sup>	45.2 <sup>1.5</sup>	61.14 <sup>0.96</sup>	75.5 <sup>2.4</sup>
30.3	44.26 <sup>1.30</sup>	79.5 <sup>1.6</sup>	29.12 <sup>1.25</sup>	46.0 <sup>1.5</sup>	53.43 <sup>1.33</sup>	93.5 <sup>0.2</sup>	41.76 <sup>1.32</sup>	46.7 <sup>1.0</sup>	60.18 <sup>1.06</sup>	77.9 <sup>1.9</sup>
May 10.2	42.96 <sup>1.17</sup>	77.9 <sup>2.0</sup>	27.87 <sup>1.05</sup>	44.5 <sup>1.9</sup>	52.10 <sup>1.29</sup>	93.7 <sup>0.4</sup>	40.44 <sup>1.33</sup>	47.7 <sup>0.5</sup>	59.12 <sup>1.13</sup>	79.8 <sup>1.5</sup>
20.2	41.79 <sup>1.00</sup>	75.9 <sup>2.4</sup>	26.82 <sup>0.82</sup>	42.6 <sup>2.2</sup>	50.81 <sup>1.21</sup>	93.3 <sup>0.9</sup>	39.11 <sup>1.31</sup>	48.2 <sup>0.0</sup>	57.99 <sup>1.17</sup>	81.3 <sup>0.9</sup>
30.2	40.79 <sup>0.82</sup>	73.5 <sup>2.7</sup>	26.00 <sup>0.55</sup>	40.4 <sup>2.6</sup>	49.60 <sup>1.09</sup>	92.4 <sup>1.4</sup>	37.80 <sup>1.27</sup>	48.2 <sup>0.6</sup>	56.82 <sup>1.19</sup>	82.2 <sup>0.4</sup>
June 9.2	39.97 <sup>0.61</sup>	70.8 <sup>3.1</sup>	25.45 <sup>0.27</sup>	37.8 <sup>2.8</sup>	48.51 <sup>0.94</sup>	91.0 <sup>1.9</sup>	36.53 <sup>1.08</sup>	47.6 <sup>1.2</sup>	55.63 <sup>1.18</sup>	82.6 <sup>0.2</sup>
19.1	39.36 <sup>0.39</sup>	67.7 <sup>3.2</sup>	25.18 <sup>0.01</sup>	35.0 <sup>2.9</sup>	47.57 <sup>0.75</sup>	89.1 <sup>2.3</sup>	35.35 <sup>1.08</sup>	46.4 <sup>1.6</sup>	54.45 <sup>1.14</sup>	82.4 <sup>0.7</sup>
29.1	38.97 <sup>0.16</sup>	64.5 <sup>3.3</sup>	25.19 <sup>0.30</sup>	32.1 <sup>3.0</sup>	46.82 <sup>0.55</sup>	86.8 <sup>2.7</sup>	34.27 <sup>0.94</sup>	44.8 <sup>1.1</sup>	53.31 <sup>1.06</sup>	81.7 <sup>1.3</sup>
July 9.1	38.81 <sup>0.07</sup>	61.2 <sup>3.3</sup>	25.49 <sup>0.58</sup>	29.1 <sup>2.9</sup>	46.27 <sup>0.34</sup>	84.1 <sup>2.9</sup>	33.33 <sup>0.78</sup>	42.7 <sup>2.5</sup>	52.25 <sup>0.96</sup>	80.4 <sup>1.7</sup>
19.0	38.88 <sup>0.30</sup>	57.9 <sup>3.2</sup>	26.07 <sup>0.84</sup>	26.2 <sup>2.9</sup>	45.93 <sup>0.11</sup>	81.2 <sup>3.2</sup>	32.55 <sup>0.59</sup>	40.2 <sup>2.8</sup>	51.29 <sup>0.83</sup>	78.7 <sup>2.2</sup>
29.0	39.18 <sup>0.53</sup>	54.7 <sup>2.7</sup>	26.91 <sup>1.09</sup>	23.3 <sup>2.7</sup>	45.82 <sup>0.11</sup>	78.0 <sup>3.3</sup>	31.96 <sup>0.37</sup>	37.4 <sup>3.0</sup>	50.46 <sup>0.67</sup>	76.5 <sup>2.6</sup>
Aug. 8.0	39.71 <sup>0.73</sup>	51.6 <sup>2.8</sup>	28.00 <sup>1.32</sup>	20.6 <sup>2.5</sup>	45.93 <sup>0.35</sup>	74.7 <sup>3.3</sup>	31.57 <sup>0.19</sup>	34.4 <sup>3.1</sup>	49.79 <sup>0.49</sup>	73.9 <sup>2.9</sup>
18.0	40.44 <sup>0.93</sup>	48.8 <sup>2.4</sup>	29.32 <sup>1.52</sup>	18.1 <sup>2.3</sup>	46.28 <sup>0.56</sup>	71.4 <sup>3.4</sup>	31.40 <sup>0.06</sup>	31.3 <sup>3.2</sup>	49.30 <sup>0.29</sup>	71.0 <sup>3.0</sup>
27.9	41.37 <sup>1.09</sup>	46.4 <sup>2.0</sup>	30.84 <sup>1.69</sup>	15.8 <sup>1.9</sup>	46.84 <sup>0.78</sup>	68.0 <sup>3.3</sup>	31.46 <sup>0.30</sup>	28.1 <sup>3.1</sup>	49.01 <sup>0.08</sup>	68.0 <sup>3.1</sup>
Sept. 6.9	42.46 <sup>1.22</sup>	44.4 <sup>1.4</sup>	32.53 <sup>1.83</sup>	13.9 <sup>1.5</sup>	47.62 <sup>0.99</sup>	64.7 <sup>3.2</sup>	31.76 <sup>0.52</sup>	25.0 <sup>2.9</sup>	48.93 <sup>0.13</sup>	64.9 <sup>3.1</sup>
16.9	43.68 <sup>1.30</sup>	43.0 <sup>0.8</sup>	34.36 <sup>1.94</sup>	12.4 <sup>1.2</sup>	48.61 <sup>1.17</sup>	61.5 <sup>2.9</sup>	32.28 <sup>0.74</sup>	22.1 <sup>2.6</sup>	49.08 <sup>0.39</sup>	61.8 <sup>3.0</sup>
26.9	44.98 <sup>1.35</sup>	42.2 <sup>0.2</sup>	36.30 <sup>2.01</sup>	11.2 <sup>0.7</sup>	49.78 <sup>1.35</sup>	58.6 <sup>2.7</sup>	33.02 <sup>0.94</sup>	19.5 <sup>2.2</sup>	49.47 <sup>0.60</sup>	58.8 <sup>2.7</sup>
Oct. 6.8	46.33 <sup>1.35</sup>	42.0 <sup>0.5</sup>	38.31 <sup>2.05</sup>	10.5 <sup>0.3</sup>	51.13 <sup>1.50</sup>	55.9 <sup>2.3</sup>	33.96 <sup>1.10</sup>	17.3 <sup>1.7</sup>	50.07 <sup>0.81</sup>	56.1 <sup>2.4</sup>
16.8	47.68 <sup>1.30</sup>	42.5 <sup>1.1</sup>	40.36 <sup>2.05</sup>	10.2 <sup>0.2</sup>	52.63 <sup>1.63</sup>	53.6 <sup>2.0</sup>	35.06 <sup>1.23</sup>	15.6 <sup>1.1</sup>	50.88 <sup>0.98</sup>	53.7 <sup>1.8</sup>
26.8	48.98 <sup>1.19</sup>	43.6 <sup>1.7</sup>	42.41 <sup>2.00</sup>	10.4 <sup>0.6</sup>	54.26 <sup>1.72</sup>	51.6 <sup>1.4</sup>	36.29 <sup>1.32</sup>	14.5 <sup>0.5</sup>	51.86 <sup>1.14</sup>	51.9 <sup>1.4</sup>
Nov. 5.7	50.17 <sup>1.05</sup>	45.3 <sup>1.2</sup>	44.41 <sup>1.91</sup>	11.0 <sup>1.2</sup>	55.98 <sup>1.79</sup>	50.2 <sup>1.0</sup>	37.61 <sup>1.36</sup>	14.0 <sup>0.2</sup>	53.00 <sup>1.24</sup>	50.5 <sup>0.7</sup>
15.7	51.22 <sup>0.87</sup>	47.5 <sup>2.7</sup>	46.32 <sup>1.76</sup>	12.2 <sup>1.6</sup>	57.77 <sup>1.80</sup>	49.2 <sup>0.4</sup>	38.97 <sup>1.36</sup>	14.2 <sup>0.8</sup>	54.24 <sup>1.31</sup>	49.8 <sup>0.1</sup>
25.7	52.09 <sup>0.65</sup>	50.2 <sup>3.1</sup>	48.08 <sup>1.58</sup>	13.8 <sup>2.1</sup>	59.57 <sup>1.77</sup>	48.8 <sup>0.1</sup>	40.33 <sup>1.29</sup>	15.0 <sup>1.5</sup>	55.55 <sup>1.33</sup>	49.7 <sup>0.6</sup>
Dec. 5.7	52.74 <sup>0.41</sup>	53.3 <sup>3.4</sup>	49.66 <sup>1.33</sup>	15.9 <sup>2.4</sup>	61.34 <sup>1.70</sup>	48.9 <sup>0.7</sup>	41.62 <sup>1.18</sup>	16.5 <sup>2.1</sup>	56.88 <sup>1.30</sup>	50.3 <sup>1.3</sup>
15.6	53.15 <sup>0.14</sup>	56.7 <sup>3.5</sup>	50.99 <sup>1.06</sup>	18.3 <sup>2.7</sup>	63.04 <sup>1.57</sup>	49.6 <sup>1.3</sup>	42.80 <sup>1.03</sup>	18.6 <sup>2.6</sup>	58.18 <sup>1.22</sup>	51.6 <sup>1.9</sup>
25.6	53.29 <sup>0.12</sup>	60.2 <sup>3.5</sup>	52.05 <sup>0.75</sup>	21.0 <sup>3.0</sup>	64.61 <sup>1.39</sup>	50.9 <sup>1.8</sup>	43.83 <sup>0.85</sup>	21.2 <sup>3.1</sup>	59.40 <sup>1.10</sup>	53.5 <sup>2.4</sup>
35.6	53.17	63.7	52.80	24.0	66.00	52.7	44.68	24.3	60.50	55.9

## FIXED STARS, 1907.

(CONSTANTS OF PARIS CONFERENCE.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Octantis.		$\beta$ Chamæleontis.		32 <sup>d</sup> Camelop. (H.)		$\kappa$ Octantis.		$\delta$ Octantis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 10 59	° 84 5	h m 12 12	° 78 47	h m 12 48	° 83 54	h m 13 25	° 85 18	h m 14 11	° 83 14
Jan. 0.7	67.70 s	14.5 s	54.04 s	19.4 s	21.86 s	52.5 s	42.48 s	8.6 s	51.05 s	7.0 s
10.7	69.44 1.74	17.0 2.5	55.22 1.18	21.1 1.7	24.08 2.22	51.9 0.6	45.37 2.89	9.1 0.5	53.10 2.05	6.8 0.2
20.7	70.91 1.47	20.0 3.0	56.31 1.09	23.3 2.2	26.28 2.20	52.0 0.1	48.23 2.86	10.2 1.1	55.19 2.09	7.3 0.5
30.7	72.09 1.18	23.3 3.3	57.29 0.98	26.0 2.7	28.39 2.11	52.7 0.7	50.97 2.74	11.9 1.7	57.26 2.07	8.3 1.0
Feb. 9.6	72.94 0.85	26.9 3.6	58.14 0.85	29.2 3.2	30.33 1.94	54.1 1.4	53.52 2.55	14.1 2.2	59.27 2.01	9.9 1.6
	72.94 0.51	26.9 3.8	58.14 0.69	29.2 3.4	30.33 1.70	54.1 1.9	53.52 2.31	14.1 2.7	59.27 1.89	9.9 2.1
19.6	73.45 0.16	30.7 3.9	58.83 0.52	32.6 3.6	32.03 1.41	56.0 2.3	55.83 2.02	16.8 3.0	61.16 1.72	12.0 2.5
Mar. 1.6	73.61 0.17	34.6 3.8	59.35 0.35	36.2 3.8	33.44 1.07	58.3 2.8	57.85 1.68	19.8 3.4	62.88 1.54	14.5 2.9
11.5	73.44 0.50	38.4 3.8	59.70 0.18	40.0 3.8	34.51 0.69	61.1 3.0	59.53 1.32	23.2 3.5	64.42 1.32	17.4 3.1
21.5	72.94 0.81	42.2 3.6	59.88 0.01	43.8 3.8	35.20 0.31	64.1 3.1	60.85 0.94	26.7 3.7	65.74 1.07	20.5 3.4
31.5	72.13 1.09	45.8 3.4	59.89 0.15	47.6 3.7	35.51 0.08	67.2 3.2	61.79 0.55	30.4 3.7	66.81 0.82	23.9 3.5
Apr. 10.5	71.04 1.34	49.2 3.0	59.74 0.31	51.3 3.4	35.43 0.44	70.4 3.0	62.34 0.14	34.1 3.8	67.63 0.55	27.4 3.6
20.4	69.70 1.56	52.2 2.7	59.43 0.46	54.7 3.2	34.99 0.78	73.4 2.8	62.48 0.24	37.9 3.6	68.18 0.27	31.0 3.6
30.4	68.14 1.74	54.9 2.2	58.97 0.58	57.9 2.9	34.21 1.09	76.2 2.5	62.24 0.64	41.5 3.4	68.45 0.01	34.6 3.5
May 10.4	66.40 1.88	57.1 1.7	58.39 0.71	60.8 2.4	33.12 1.35	78.7 2.0	61.60 1.01	44.9 3.2	68.44 0.29	38.1 3.4
20.4	64.52 1.98	58.8 1.2	57.68 0.81	63.2 2.0	31.77 1.56	80.7 1.6	60.59 1.36	48.1 2.9	68.15 0.55	41.5 3.1
30.3	62.54 2.04	60.0 0.7	56.87 0.88	65.2 1.5	30.21 1.71	82.3 1.1	59.23 1.68	51.0 2.5	67.60 0.82	44.6 2.8
June 9.3	60.50 2.04	60.7 0.1	55.99 0.95	66.7 1.0	28.50 1.81	83.4 0.6	57.55 1.94	53.5 2.0	66.78 1.05	47.4 2.5
19.3	58.46 2.00	60.8 0.4	55.04 0.98	67.7 0.5	26.69 1.86	84.0 0.0	55.61 2.18	55.5 1.6	65.73 1.25	49.9 2.0
29.2	56.46 1.90	60.4 1.0	54.06 1.00	68.2 0.1	24.83 1.86	84.0 0.6	53.43 2.34	57.1 1.0	64.48 1.43	51.9 1.6
July 9.2	54.56 1.74	59.4 1.5	53.06 0.98	68.1 0.6	22.97 1.82	83.4 1.1	51.09 2.44	58.1 0.5	63.05 1.57	53.5 1.0
19.2	52.82 1.54	57.9 1.9	52.08 0.93	67.5 1.2	21.15 1.72	82.3 1.7	48.65 2.47	58.6 0.1	61.48 1.65	54.5 0.5
29.2	51.28 1.30	56.0 2.4	51.15 0.85	66.3 1.7	19.43 1.59	80.6 2.1	46.18 2.42	58.5 0.7	59.83 1.69	55.0 0.1
Aug. 8.1	49.98 0.99	53.6 2.7	50.30 0.74	64.6 2.1	17.84 1.42	78.5 2.6	43.76 2.29	57.8 1.2	58.14 1.66	54.9 0.7
18.1	48.99 0.66	50.9 3.0	49.56 0.61	62.5 2.5	16.42 1.22	75.9 2.9	41.47 2.08	56.6 1.7	56.48 1.59	54.2 1.2
28.1	48.33 0.30	47.9 3.1	48.95 0.45	60.0 2.8	15.20 0.98	73.0 3.3	39.39 1.79	54.9 2.2	54.89 1.44	53.0 1.6
Sept. 7.1	48.03 0.09	44.8 3.1	48.50 0.26	57.2 3.0	14.22 0.72	69.7 3.5	37.60 1.43	52.7 2.5	53.45 1.25	51.4 2.2
17.0	48.12 0.47	41.7 3.1	48.24 0.07	54.2 3.0	13.50 0.44	66.2 3.8	36.17 1.01	50.2 2.9	52.20 0.99	49.2 2.5
27.0	48.59 0.85	38.6 2.8	48.17 0.13	51.2 3.0	13.06 0.15	62.4 3.8	35.16 0.53	47.3 3.0	51.21 0.69	46.7 2.8
Oct. 7.0	49.44 1.20	35.8 2.5	48.32 0.36	48.2 2.9	12.91 0.17	58.6 3.9	34.63 0.03	44.3 3.1	50.52 0.36	43.9 2.9
16.9	50.64 1.52	33.3 2.1	48.68 0.56	45.3 2.6	13.08 0.49	54.7 3.8	34.60 0.49	41.2 3.0	50.16 0.00	41.0 3.0
26.9	52.16 1.79	31.2 1.6	49.24 0.76	42.7 2.2	13.57 0.82	50.9 3.7	35.09 0.99	38.2 2.8	50.16 0.37	38.0 3.0
Nov. 5.9	53.95 1.99	29.6 1.0	50.00 0.92	40.5 1.7	14.39 1.13	47.2 3.5	36.08 1.48	35.4 2.6	50.53 0.73	35.0 2.8
15.9	55.94 2.12	28.6 0.4	50.92 1.06	38.8 1.2	15.52 1.43	43.7 3.1	37.56 1.90	32.8 2.1	51.26 1.08	32.2 2.5
25.8	58.06 2.17	28.2 0.3	51.98 1.16	37.6 0.5	16.95 1.70	40.6 2.8	39.46 2.27	30.7 1.7	52.34 1.38	29.7 2.1
Dec. 5.8	60.23 2.14	28.5 0.9	53.14 1.22	37.1 0.1	18.65 1.92	37.8 2.2	41.73 2.57	29.0 1.0	53.72 1.64	27.6 1.6
15.8	62.37 2.04	29.4 1.6	54.36 1.23	37.2 0.7	20.57 2.09	35.6 1.7	44.30 2.76	28.0 0.5	55.36 1.84	26.0 1.0
25.8	64.41 1.87	31.0 2.2	55.59 1.21	37.9 1.3	22.66 2.19	33.9 1.0	47.06 2.87	27.5 0.1	57.20 2.00	25.0 0.5
35.7	66.28	33.2	56.80	39.2	24.85	32.9	49.93	27.6	59.20	24.5

# FIXED STARS, 1907.

(CONSTANTS OF PARIS CONFERENCE.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Apodis.		$\rho$ Octantis.		$\gamma$ Apodis.		$\epsilon$ Ursæ Minoris.		$\sigma$ Octantis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 14 36	° ' " -78 38	h m 15 21	° ' " -84 8	h m 16 19	° ' " -78 40	h m 16 55	° ' " +82 11	h 19	° ' " -89 14
Jan. 0.9	12.12 s	37.0 "	33.51 s	61.2 "	2.22 s	63.3 "	20.11 s	27.0 "	9 11.7 m s	36.2 "
10.9	13.37 1.25	36.6 0.4	35.70 2.19	60.0 1.2	3.26 1.04	61.6 1.7	20.80 0.69	23.6 3.4	9 15.1 3.4	32.8 3.4
20.9	14.66 1.29	36.8 0.2	38.06 2.36	59.4 0.6	4.43 1.17	60.3 1.3	21.77 0.97	20.6 3.0	9 21.5 6.4	29.5 3.3
30.8	15.96 1.30	37.6 0.8	40.52 2.46	59.4 0.0	5.69 1.26	59.5 0.8	22.98 1.21	18.1 2.5	9 30.8 9.3	26.4 3.1
Feb. 9.8	17.24 1.28	38.9 1.3	43.02 2.50	59.9 0.5	7.02 1.33	59.2 0.3	24.39 1.41	16.1 2.0	9 42.7 11.9	23.5 2.9
	17.24 1.22	38.9 1.8	43.02 2.47	59.9 1.0	7.02 1.35	59.2 0.2	24.39 1.54	16.1 1.5	9 42.7 14.1	23.5 2.5
19.8	18.46 1.14	40.7 2.2	45.49 2.38	60.9 1.5	8.37 1.35	59.4 0.6	25.93 1.63	14.6 0.8	9 56.8 15.9	21.0 2.2
Mar. 1.8	19.60 1.04	42.9 2.5	47.87 2.25	62.4 2.0	9.72 1.32	60.0 1.1	27.56 1.64	13.8 0.1	10 12.7 17.3	18.8 1.7
11.7	20.64 0.92	45.4 2.9	50.12 2.07	64.4 2.3	11.04 1.26	61.1 1.5	29.20 1.60	13.7 0.5	10 30.0 18.4	17.1 1.3
21.7	21.56 0.78	48.3 3.2	52.19 1.86	66.7 2.7	12.30 1.19	62.6 1.9	30.80 1.50	14.2 1.2	10 48.4 19.0	15.8 0.9
31.7	22.34 0.64	51.5 3.3	54.05 1.60	69.4 3.0	13.49 1.08	64.5 2.3	32.30 1.36	15.4 1.7	11 7.4 19.2	14.9 0.3
Apr. 10.6	22.98 0.48	54.8 3.4	55.65 1.33	72.4 3.2	14.57 0.97	66.8 2.5	33.66 1.16	17.1 2.2	11 26.6 19.0	14.6 0.1
20.6	23.46 0.32	58.2 3.4	56.98 1.02	75.6 3.3	15.54 0.83	69.3 2.7	34.82 0.93	19.3 2.6	11 45.6 18.5	14.7 0.6
30.6	23.78 0.16	61.6 3.4	58.00 0.70	78.9 3.4	16.37 0.68	72.0 3.0	35.75 0.68	21.9 2.8	12 4.1 17.5	15.3 1.1
May 10.6	23.94 0.02	65.0 3.4	58.70 0.36	82.3 3.4	17.05 0.52	75.0 3.0	36.43 0.41	24.7 3.1	12 21.6 16.2	16.4 1.5
20.5	23.92 0.17	68.3 3.1	59.06 0.02	85.7 3.3	17.57 0.34	78.0 3.1	36.84 0.13	27.8 3.2	12 37.8 14.6	17.9 1.9
30.5	23.75 0.34	71.4 2.8	59.08 0.31	89.0 3.2	17.91 0.16	81.1 3.1	36.97 0.16	31.0 3.1	12 52.4 12.5	19.8 2.3
June 9.5	23.41 0.49	74.2 2.5	58.77 0.65	92.2 3.0	18.07 0.02	84.2 3.0	36.81 0.43	34.1 3.0	13 4.9 10.3	22.1 2.6
19.5	22.92 0.63	76.7 2.1	58.12 0.97	95.2 2.6	18.05 0.20	87.2 2.8	36.38 0.69	37.1 2.8	13 15.2 7.7	24.7 2.9
29.4	22.29 0.75	78.8 1.7	57.15 1.25	97.8 2.3	17.85 0.38	90.0 2.5	35.69 0.94	39.9 2.6	13 22.9 5.0	27.6 3.0
July 9.4	21.54 0.85	80.5 1.2	55.90 1.50	100.1 1.9	17.47 0.54	92.5 2.3	34.75 1.15	42.5 2.2	13 27.9 2.1	30.6 3.1
19.4	20.69 0.92	81.7 0.7	54.40 1.70	102.0 1.4	16.93 0.69	94.8 1.9	33.60 1.34	44.7 1.8	13 30.0 0.8	33.7 3.2
29.3	19.77 0.97	82.4 0.2	52.70 1.86	103.4 0.8	16.24 0.82	96.7 1.4	32.26 1.50	46.5 1.4	13 29.2 3.7	36.9 3.0
Aug. 8.3	18.80 0.98	82.6 0.4	50.84 1.95	104.2 0.3	15.42 0.91	98.1 1.0	30.76 1.63	47.9 1.0	13 25.5 6.6	39.9 2.8
18.3	17.82 0.95	82.2 0.9	48.89 1.97	104.5 0.2	14.51 0.98	99.1 0.4	29.13 1.72	48.9 0.4	13 18.9 9.1	42.7 2.5
28.3	16.87 0.89	81.3 1.4	46.92 1.92	104.3 0.8	13.53 1.00	99.5 0.1	27.41 1.77	49.3 0.1	13 9.8 11.5	45.2 2.1
Sept. 7.2	15.98 0.79	79.9 1.9	45.00 1.79	103.5 1.4	12.53 0.99	99.4 0.6	25.64 1.79	49.2 0.6	12 58.3 13.4	47.3 1.7
17.2	15.19 0.66	78.0 2.3	43.21 1.59	102.1 1.9	11.54 0.93	98.8 1.2	23.85 1.75	48.6 1.0	12 44.9 14.7	49.0 1.1
27.2	14.53 0.49	75.7 2.6	41.62 1.33	100.2 2.3	10.61 0.84	97.6 1.6	22.10 1.68	47.6 1.6	12 30.2 15.6	50.1 0.6
Oct. 7.2	14.04 0.30	73.1 2.8	40.29 1.00	97.9 2.6	9.77 0.70	96.0 2.1	20.42 1.56	46.0 2.0	12 14.6 15.9	50.7 0.1
17.1	13.74 0.09	70.3 2.9	39.29 0.61	95.3 2.9	9.07 0.53	93.9 2.4	18.86 1.41	44.0 2.5	11 58.7 15.4	50.6 0.7
27.1	13.65 0.14	67.4 2.9	38.68 0.20	92.4 3.0	8.54 0.33	91.5 2.7	17.45 1.21	41.5 2.8	11 43.3 14.4	49.9 1.3
Nov. 6.1	13.79 0.36	64.5 2.7	38.48 0.23	89.4 3.0	8.21 0.11	88.8 2.8	16.24 0.98	38.7 3.2	11 28.9 12.7	48.6 1.9
16.0	14.15 0.58	61.8 2.5	38.71 0.66	86.4 2.9	8.10 0.12	86.0 2.9	15.26 0.71	35.5 3.4	11 16.2 10.6	46.7 2.3
26.0	14.73 0.78	59.3 2.2	39.37 1.07	83.5 2.7	8.22 0.35	83.1 2.8	14.55 0.42	32.1 3.7	11 5.6 7.9	44.4 2.8
Dec. 6.0	15.51 0.96	57.1 1.7	40.44 1.45	80.8 2.4	8.57 0.56	80.3 2.6	14.13 0.11	28.4 3.7	10 57.7 5.0	41.6 3.0
16.0	16.47 1.09	55.4 1.3	41.89 1.79	78.4 1.9	9.13 0.78	77.7 2.3	14.02 0.20	24.7 3.6	10 52.7 1.9	38.6 3.3
25.9	17.56 1.21	54.1 0.6	43.68 2.06	76.5 1.5	9.91 0.94	75.4 2.0	14.22 0.51	21.1 3.5	10 50.8 1.4	35.3 3.4
35.9	18.77	53.5	45.74	75.0	10.85	73.4	14.73	17.6	10 52.2	31.9

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	12 Year Cat. 1879.		$\lambda^1$ Octantis.		$\nu$ Octantis.		$\beta$ Octantis.		$\gamma^1$ Octantis.	
	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination South.
	h m 20 51	° ' " +80 11	h m 21 36	° ' " -83 8	h m 22 13	° ' " -86 26	h m 22 36	° ' " -81 51	h m 23 46	° ' " -82 31
Jan. 1.2	45.43	85.3	30.58	65.5	42.24	46.8	26.51	90.7	33.96	93.6
11.1	44.72	82.5	29.84	62.6	40.21	44.1	25.55	88.3	32.56	92.0
21.1	44.22	79.3	29.40	59.4	38.70	40.9	24.79	85.5	31.30	89.8
31.1	43.96	75.9	29.26	55.9	37.74	37.5	24.26	82.3	30.22	87.2
Feb. 10.0	43.95	72.5	29.43	52.4	37.34	33.9	23.96	78.8	29.35	84.1
20.0	44.18	69.2	29.90	48.8	37.53	30.2	23.90	75.2	28.70	80.7
Mar. 2.0	44.65	66.0	30.66	45.2	38.28	26.4	24.08	71.5	28.30	77.1
12.0	45.34	63.2	31.68	41.8	39.56	22.7	24.50	67.8	28.15	73.3
21.9	46.22	60.8	32.94	38.6	41.35	19.2	25.15	64.2	28.26	69.5
31.9	47.26	58.9	34.42	35.7	43.60	16.0	26.01	60.7	28.62	65.7
Apr. 10.9	48.41	57.6	36.08	33.2	46.26	13.0	27.06	57.5	29.22	62.0
20.9	49.64	56.9	37.89	31.0	49.28	10.3	28.29	54.6	30.06	58.5
30.8	50.90	56.8	39.82	29.3	52.58	8.1	29.68	52.0	31.12	55.2
May 10.8	52.16	57.4	41.83	28.0	56.11	6.4	31.19	49.9	32.37	52.2
20.8	53.37	58.5	43.87	27.2	59.79	5.1	32.79	48.2	33.80	49.7
30.7	54.49	60.2	45.90	26.9	63.53	4.4	34.44	47.1	35.36	47.6
June 9.7	55.49	62.4	47.87	27.2	67.25	4.2	36.12	46.5	37.04	46.0
19.7	56.33	65.0	49.75	28.0	70.87	4.5	37.78	46.4	38.77	44.9
29.7	57.01	68.0	51.47	29.3	74.30	5.4	39.38	46.8	40.53	44.4
July 9.6	57.49	71.3	53.00	31.0	77.44	6.8	40.88	47.8	42.26	44.5
19.6	57.77	74.7	54.30	33.2	80.21	8.6	42.23	49.3	43.92	45.1
29.6	57.84	78.2	55.32	35.7	82.53	10.9	43.40	51.2	45.46	46.3
Aug. 8.6	57.70	81.8	56.05	38.4	84.34	13.5	44.35	53.6	46.84	48.0
18.5	57.35	85.3	56.45	41.3	85.56	16.3	45.06	56.2	48.00	50.1
28.5	56.80	88.6	56.51	44.3	86.17	19.3	45.50	59.1	48.92	52.7
Sept. 7.5	56.06	91.8	56.24	47.3	86.13	22.4	45.66	62.1	49.56	55.5
17.4	55.16	94.7	55.64	50.2	85.45	25.5	45.54	65.2	49.91	58.5
27.4	54.11	97.3	54.75	52.8	84.16	28.3	45.13	68.1	49.94	61.6
Oct. 7.4	52.93	99.4	53.58	55.1	82.29	30.9	44.46	70.8	49.66	64.6
17.4	51.66	101.1	52.19	56.9	79.91	33.1	43.55	73.2	49.09	67.5
27.3	50.31	102.4	50.65	58.2	77.13	34.8	42.45	75.2	48.24	70.2
Nov. 6.3	48.93	103.0	49.01	58.9	74.05	36.0	41.20	76.7	47.15	72.4
16.3	47.55	103.1	47.34	59.0	70.80	36.5	39.85	77.6	45.87	74.2
26.3	46.20	102.6	45.70	58.4	67.90	36.4	38.45	77.9	44.44	75.5
Dec. 6.2	44.92	101.6	44.17	57.3	64.28	35.7	37.06	77.6	42.92	76.1
16.2	43.76	100.0	42.81	55.6	61.26	34.3	35.74	76.6	41.36	76.1
26.2	42.73	97.8	41.66	53.3	58.56	32.4	34.52	75.1	39.82	75.4
36.1	41.89	95.2	40.76	50.6	56.26	29.9	33.46	73.0	38.36	74.1

## ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

The first part of this Ephemeris, embracing the positions of the Sun and Moon, the distances of the Moon from the center of the Sun, from the centers of the four most conspicuous planets, and from certain fixed stars, together with the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder of the work is intended to meet the wants of astronomers. It contains the ephemerides of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the Sun, the Moon's longitude and latitude, data for the libration of the Moon, the obliquity of the ecliptic, the nutation, the positions of 383 standard stars, the ephemeris for the meridian of Washington, etc.

### TIME.

Astronomers make use of three different kinds of time, namely: First, true or apparent solar time; second, mean solar time; third, sidereal time.

*True or Apparent Solar Time.*—This species of time is called indiscriminately either true solar time or apparent solar time, and is measured by the motion of the true Sun; the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being always the hour angle of the Sun from the meridian. This is the most obvious and natural measure of time, but owing to the obliquity of the ecliptic and the varying motion of the Earth in its orbit, the intervals between successive returns of the Sun to the same meridian are not exactly equal, and consequently ordinary clocks and chronometers can not be regulated to true solar time.

*Mean Solar Time.*—To avoid the irregularity which would arise from using the true solar day, astronomers have recourse to a mean solar day; whose length is equal to the average of all the true solar days in a year. Just as the true solar day depends upon the motion of the true Sun, so the mean solar day is made to depend upon the motion of an imaginary mean Sun which moves along the equator at a perfectly uniform rate, and whose hour angle from any given meridian is always the mean solar time thereat. Ordinary clocks and watches and the chronometers used by navigators are regulated to this species of time.

*Equation of Time.*—The imaginary mean Sun is supposed to keep as near the true Sun as is consistent with perfect uniformity of motion, but it is sometimes before and sometimes behind the latter, the greatest difference amounting to rather more than one-quarter of an hour. The interval between the true Sun and the imaginary mean Sun is the equation of time, given on pages I and II of the Ephemeris for the meridian of Greenwich, and a knowledge of it is necessary for converting true solar time into mean solar time, or vice versa. As the mean Sun is an imaginary body, mean solar time can not be directly observed, but it can be got either from observations of the true Sun by applying to them the correction for the equation of time, or from observations of the stars by means of the sidereal time of mean noon, given on page II of the Ephemeris for the meridian of Greenwich.

*Sidereal Time.*—Sidereal time is measured, roughly speaking, by the daily motion of the stars; or in strict accuracy, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted. The point in question is the vernal equinox, and its hour angle is always the sidereal time. Astronomical clocks are usually regulated to sidereal time, and are then called sidereal clocks.

*Sidereal Day.*—A sidereal day is the interval between two successive transits of the vernal equinox over the same meridian. It is  $3^m 55^s.909$  of mean solar time shorter than the mean solar day, the tropical year of 365.2422 solar days being divided into 366.2422 sidereal days, each comprising 24 sidereal hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 23 of each year the sidereal clock agrees with the mean-time or ordinary clock, and the former gains on the latter  $3^m 56^s.555$  of sidereal time per day, so that at the end of a year it will have gained an entire day, and will again agree with the mean-time clock.

*Civil Day.*—According to the customs of society, the civil day commences at midnight, and comprises twenty-four hours, which extend to the next following midnight. The hours are counted from 0 to 12 in two series; the first, marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

*Astronomical Day.*—The astronomical day begins at noon on the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and run from the noon of one day to that of the next following. Astronomical time as well as civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day corresponds to the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Thus, January 9, 2 o'clock, A. M., civil time, is January 8,  $14^h$ , astronomical time; and January 9, 2 o'clock, P. M., civil time, is also January 9,  $2^h$ , astronomical time. Hence, we have the following rules:

*To convert Civil Time into Astronomical Time.*—If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result will be the corresponding astronomical time; if the civil time is marked P. M., take away the designation P. M., and the astronomical time will result.

*To convert Astronomical Time into Civil Time.*—If the astronomical time is less than twelve hours, simply write P. M. after it. If greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the days. For example, October 3, 23 hours astronomical time, is October 4, 11 o'clock, A. M., civil time.

*To find Greenwich Time.*—Express the longitude from Greenwich in time, and when west, add it to the local time, or when east, subtract it from the local time. The result will be the corresponding Greenwich time; mean or sidereal, according as the local time employed is mean or sidereal. For use with Part I of this Ephemeris, Greenwich mean time is ordinarily required.

#### PART I—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2–217 give data arranged under the heads of the several months, and are therefore designated as the Calendar. Each month covers 18 pages, numbered from I to XVIII, whose contents are as follows:

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension and Declination*, and the *Equation of Time*. Adjoining columns contain the differences of these quantities for one hour. By multiplying any one of these differences by



the hours and parts of an hour from Greenwich apparent noon, and adding the product to, or subtracting it from, the corresponding quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of the quantity in question for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, but, when great accuracy is required, they should be interpolated for half the hours and parts of an hour of the Greenwich apparent time.

The *Equation of Time* given on page I is the mean time of apparent noon, or the hour angle of the mean Sun at that instant. The heading of the column directs how the equation is to be applied to apparent time, or the time given by an observation of the Sun, in order to get mean time. When in the course of the month there is a change from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change occurs.

The *Sun's Semidiameter* and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The semidiameter is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object, to the distance from the center of the Sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the Sun's center over the wires of a transit instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

This page is chiefly used when the Sun is observed on the meridian, at which instant the local apparent time is  $0^h 0^m 0^s$ . The longitude from Greenwich expressed in time is then the corresponding Greenwich apparent time, before or after noon according as the longitude is east or west. The longitude of any place is therefore the factor employed in reducing the quantities on this page to apparent noon at that place.

The right ascension of the Sun thus reduced is the sidereal time of local apparent noon, and the difference between that and the clock time of the meridian passage of the Sun is the error of the clock on sidereal time.

The declination of the Sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the Sun.

As an example of the use of page I:—

Let the Sun's declination be required at apparent noon, 1907, May 15, at a place whose longitude is  $89^\circ 40'$ , or  $5^h 58^m 40^s$  east from Greenwich:—

		h	m	s
Local apparent time	May 15,	0	0	0
Longitude from Greenwich (subtractive)		5	58	40
Greenwich apparent time	May 14,	18	1	20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is  $18^h.022$  after Greenwich apparent noon on May 14, or  $5^h.978$  before Greenwich apparent noon on May 15.

On page 74 of the Ephemeris we find that the change of declination in one hour is:

May 14, at Greenwich apparent noon	+	36.92
May 15, at Greenwich apparent noon	+	36.14
Difference for one day	—	0.78

If great exactness is desired, we find the amount of this hourly difference for the time which is halfway between Greenwich noon and the time of observation; that is, for 9 hours

after Greenwich noon of the 14th, this being half of 18 hours. Nine hours is 0.375 of a day; so the calculation is as follows:

Difference for one hour, May 14	.	.	.	.	.	+	36.92
Change for 0.375 of a day or $0''.78 \times 0.375$	.	.	.	.	.	-	0.29
Difference at 9 hours after noon	.	.	.	.	.	+	36.63
$35''.63 \times 18.022 = 660''.1 = 11' 0''.1$							
Declination at Greenwich noon, May 14	.	.	.	.	.	N. 18 24 43.7	
Change in 18.022 hours (additive)	.	.	.	.	.	11 0.1	
Sun's declination at time of observation	.	.	.	.	.	N. 18 35 43.8	

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is 5<sup>h</sup>.978 before Greenwich noon of May 15; half this interval is about 0.12 of a day, and the hourly motion for the middle of the interval is 36''.23. Then, we find—

Declination at Greenwich noon, May 15	.	.	.	.	N. 18 39 20.5
Product of $36''.23 \times 5.978 = 216''.6$ (subtractive)	.	.	.	.	3 36.6
Sun's declination at time of observation	.	.	.	.	N. 18 35 43.9

It will always be well to make the calculation in both ways, as a check; but if the results differ slightly, the one derived from the nearest noon should be regarded as the more accurate. At sea, however, it is ordinarily sufficient to compute the declination to the nearest half minute, and the reduction may then be found by Table 12 of BOWDITCH'S *American Practical Navigator*.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension and Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon*. The hourly changes of these quantities are also given, and may be used in reducing them for the longitude, or to any Greenwich mean time. When great precision is required, these changes should be interpolated for half the Greenwich time, as described in explaining the calculation of the declination.

The *Equation of Time* given on page II is the apparent time of mean noon, and is equivalent to the hour angle of the true Sun at the instant of mean noon. The heading of the column directs how the equation must be applied to mean time in order to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, 9<sup>s</sup>.8565; or by Table III appended to this volume, for reducing intervals of mean solar to sidereal time; or by Table 9 of BOWDITCH'S *Navigator*.

The right ascensions and declinations on pages I and II are affected both by aberration and nutation, and therefore denote the *apparent* positions of the *true* Sun. Page I is used for observations which depend upon apparent time, as when the Sun is observed on the meridian; while page II is used when the times have been noted by a clock or chronometer regulated to mean time, as is the case in most observations of the Sun out of the meridian.

The Sun's declination is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth, and the equation of time is needed in finding the apparent time when determining the latitude from observations of the Sun out of the meridian.

The sidereal time of mean noon, or right ascension of the mean Sun, is useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the right ascension of the mean Sun for that time, and this being added to the local astronomical mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time gives the interval of sidereal time from noon, and that is converted into the required mean time by subtracting from it the corresponding reduction of a sidereal interval to a mean-time interval, taken from Table II appended to this volume, or from Table 8 of BOWDITCH's *Navigator*. Instead of using Table II, this reduction may be found by multiplying  $9^s.8296$  by the hours and parts of an hour of the sidereal interval from noon.

As examples of the use of page II:—

1.—Let the Sun's right ascension and the equation of time be required for 1907, May 22,  $9^h 2^m 30^s$ , A. M., mean time, at a place whose longitude is  $100^\circ 10'$ , or  $6^h 40^m 40^s$ , west of Greenwich.

Local astronomical mean time . . . . .	May 21,	$21 \ 2 \ 30$
Longitude from Greenwich (additive) . . . . .		$6 \ 40 \ 40$
Greenwich mean time . . . . .	May 22,	$3 \ 43 \ 10 = 3^h.7194$

<i>Sun's Right Ascension.</i>	<i>Equation of Time.</i>
May 22, Greenwich noon . . . . .	May 22, Greenwich noon . . . . .
H. D. $10^s.014 \times 3.7194$ . . . . .	H. D. $-0^s.167 \times 3.7194$ . . . . .
$3 \ 52 \ 15.51$	$3 \ 35.67$ (additive)
$+$ $37.25$	$- \ 0.62$
$3 \ 52 \ 52.76$	$3 \ 35.05$

In this case the hourly differences interpolated to half the interval, or  $1^h.86$  after noon, have been used. The equation of time is here additive to mean time. Its reduction could have been found by Table 12 of BOWDITCH's *Navigator*.

2.—If the sidereal time is required for the same date and time, we have—

May 22, sidereal time (at Greenwich mean noon) . . . . .	$3 \ 55 \ 51.18$
Reduction for $3^h 43^m 10^s$ from Table III, or $9^s.8565 \times 3.7194$ . . . . .	$+$ $36.66$
Add the local astronomical mean time . . . . .	$21 \ 2 \ 30.00$
The required sidereal time is (rejecting $24^h$ ) . . . . .	$0 \ 58 \ 57.84$

The reduction  $36.66$  could have been found in Table III corresponding to the Greenwich mean time  $3^h 43^m 10^s$ , or by Table 9 of BOWDITCH's *Navigator*.

3.—On 1907, May 22, A. M., at a place whose longitude is  $100^\circ 10' W.$ , suppose the sidereal time to be  $0^h 58^m 57^s.84$ , and that the corresponding mean time is required.

The astronomical day is May 21; the longitude in time,  $+ 6^h 40^m 40^s$ , or  $+ 6^h.678$ .

May 21, sidereal time (at Greenwich mean noon) . . . . .	$3 \ 51 \ 54.63$
Reduction for $6^h 40^m 40^s$ from Table III, or $9^s.8565 \times 6.678$ . . . . .	$+$ $1 \ 5.82$
The sidereal time of local mean noon . . . . .	$3 \ 53 \ 0.45$
The given sidereal time ( $+ 24^h$ , if necessary for the following subtraction) . . . . .	$24 \ 58 \ 57.84$
Subtracting the first from the second gives the sidereal interval from noon . . . . .	$21 \ 5 \ 57.39 = 21^h.0993$
Reduction for $21^h 5^m 57^s.39$ from Table II, or $-9^s.8296 \times 21.0993$ . . . . .	$- \ 3 \ 27.40$
The required astronomical mean time is . . . . .	May 21, $21 \ 2 \ 29.99$

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude* and *Latitude*, and the *Logarithm of the Radius Vector of the Earth*. The longitudes of the Sun are the true geometric longitudes, not corrected for aberration. They are given in two columns, headed respectively  $\lambda$  and  $\lambda'$ ;  $\lambda$  representing the Sun's longitude counted from the true equinox of the date; and  $\lambda'$ , the same co-ordinate counted from the mean equinox of the beginning of the Besselian fictitious year. The latitude is referred to the mean ecliptic of the date. Columns of hourly differences are given to facilitate finding the Sun's longitude, or the logarithm of the radius vector, for any hour from noon.

The last column on page III contains the *Mean Time of Sidereal Noon*; that is, the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich. It may be reduced to any meridian, or to any Greenwich sidereal time, by using the hourly difference,  $-9^s.8296$ , to effect the necessary interpolation. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time, or from Table 8 of BOWDITCH's *Navigator*.

This column may be used in converting sidereal time to mean time, instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for May 20, that is, the preceding astronomical day.

May 21, the mean time of Greenwich sidereal noon is . . . . .	h	m	s
	20	4	47.46
Reduction for longitude from Table II, or $-9^s.8296 \times 6.678$ . . . . .	—	1	5.64
<hr/>			
The mean time of local sidereal noon . . . . .	20	3	41.82
Add the given sidereal time . . . . .		58	57.84 = $0^h.9827$
<hr/>			
The sum is . . . . .	21	2	39.66
Reduction for $0^h 58^m 57^s.84$ from Table II, or $-9^s.8296 \times 0.9827$ . . . . .	—		9.66
<hr/>			
The required astronomical mean time . . . . .	May 21, 21	2	30.00

Page IV contains *The Moon's Semidiameter* and *Equatorial Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of that quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the Sun's declination and the equation of time in the preceding examples. The sign plus or minus is prefixed to the hourly differences, according as the horizontal parallax is increasing or decreasing.

The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.273, or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for 1907, December 9, 9<sup>h</sup>, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of December 9 is 4".5; then,

$$12^h : 9^h = 4''.5 : 3''.4,$$

which is the correction to be subtracted from the semidiameter at noon, because the semidiameter is decreasing. The Moon's semidiameter for December 9, 9<sup>h</sup>, is therefore 16' 19".2.

The Moon's semidiameter and horizontal parallax are required for all observations of the Moon. When great precision is needed, the hourly differences should be interpolated for half the interval of Greenwich time from noon or midnight, and the horizontal parallax should be corrected for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich* and the *Age of the Moon* are also contained on page IV. The time of transit is given to tenths of a minute, and is accompanied by a column of differences for one hour of longitude, by means of which the local time of the Moon's meridian transit may be computed for any other place whose longitude is known. Table 11 of BOWDITCH's *Navigator* furnishes the necessary reduction by simple inspection. The age of the Moon, or the time elapsed since the preceding new Moon, is given to tenths of a day.

Pages V–XII contain *The Moon's Right Ascension* and *Declination* for each day and hour of Greenwich mean time. They are accompanied by columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may either be taken from a well-regulated chronometer, or may be obtained by applying the longitude, converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the given day and hour of

Greenwich mean time; the *Diff. for 1 Minute* is multiplied by the minutes and parts of a minute of the Greenwich time, and the product is added to or subtracted from the quantity, according as the latter is increasing or decreasing.

Thus, suppose the Moon's right ascension and declination are required for 1907, June 20, 10<sup>h</sup> 10<sup>m</sup> 30<sup>s</sup>, astronomical mean time at Greenwich:—

<i>Right Ascension.</i>			<i>Declination.</i>		
	<i>h</i>	<i>m</i>	<i>s</i>		<i>°</i>
June 20, 10 <sup>h</sup>	13	23	15.89		S. 3 7 7.0
Diff. 2.1040 × 10.5			22.09	+ 12.500 × 10.5	2 11.2
June 20, 10 <sup>h</sup> 10 <sup>m</sup> 30 <sup>s</sup>	13	23	37.98		S. 3 9 18.2

For the sake of precision, the differences here employed have been interpolated for 5<sup>m</sup>.2 = 0<sup>h</sup>.09.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the Earth.

Pages XIII–XVIII contain the *Lunar Distances*, or the angular distances of the center of the Moon from the center of the Sun, from the centers of the four brighter planets, and from certain fixed stars, as they would appear to an observer at the center of the Earth. They are given for every third hour of Greenwich mean time, and as the reckoning begins at noon, the dates are astronomical. All the distances which can be observed on the same day are grouped together under that date, and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the Sun, planet, or star, to indicate whether it is on the west or east side of the Moon.

An observer on the Earth's surface by measuring a lunar distance, correcting it for errors of his instrument and for the semidiameters of the objects, and clearing it from the effects of refraction and parallax, finds the true or geocentric distance; that is, the distance as it would have appeared from the center of the Earth at the moment of observation. By comparing this distance with the corresponding distances given in the Ephemeris, the Greenwich mean time of the observation can be derived.

To lessen the labor of computation, the Ephemeris contains, between every two successive distances, the logarithm of the seconds of time in which the distance changes one second of arc; or, as it is usually called, the *Proportional Logarithm of the Difference*. It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time corresponding to a given lunar distance we have the following rule:

*Find in the Almanac the two distances between which the true distance falls; take out the nearer of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.*

*Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in Table 45 of BOWDITCH'S Navigator, subtract the P. L. of Diff. taken from the Almanac.*

*The result will be the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac distance is used; or to be subtracted from the hours of Greenwich time, when the later Almanac distance is used.*

Another method is, to add the common logarithm of the difference in seconds between the true and the Almanac distances to the P. L. of Diff. of the Almanac; and then the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. Table 34 of BOWDITCH'S *Navigator* saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies continually, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which



is required. The daily motion is given for the instant of Greenwich mean noon. The column *Reduction to Orbit* contains the correction to be applied to the heliocentric longitude in order to obtain the longitude counted along the orbit of the planet. The latter is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The heliocentric latitude is counted from the mean ecliptic of the date. The *Logarithm of Radius Vector* is the logarithm of the distance of the center of the planet from that of the Sun, at the Greenwich mean noon whose date is given in the first column. The last two columns give, respectively, the logarithm of the true distance of the center of the planet from that of the Earth, for the Greenwich noon indicated on the left-hand side of the page, and for the time which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean midnight of the same day; in the case of Venus and Mars, it is the mean noon of the day immediately following; in the case of Jupiter and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 272-279 contain the rectangular co-ordinates of the center of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox of each date as the plane and point of reference. Each co-ordinate is given both for Greenwich mean noon, and for Greenwich mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan. 0* give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of the beginning of the Besselian fictitious year.

Pages 280-283 give for every Greenwich mean noon and midnight the apparent geocentric longitude and latitude of the Moon referred to the true ecliptic and equinox of the date.

Page 284 contains the position of the Moon's equator, the longitude of the Moon's perigee, the mean longitude of the Moon's ascending node, and the Moon's mean longitude.

Page 285 contains the elements of the libration of the Moon, and the Sun's aberration and horizontal parallax. The epochs of greatest libration of the Moon, together with the formulæ for finding the libration in longitude and latitude, are given on page 444. The *Sun's Aberration* is the quantity which is to be applied to the true longitude of the Sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The *Sun's Equatorial Horizontal Parallax*, given in the last column, is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

Pages 286-288 give data for precession and the obliquity of the ecliptic, together with all sensible terms arising from the motions of the equator and ecliptic. To show clearly the relations of these quantities, let

$\lambda$  = the longitude of any body referred to the true equinox of the date.

$\lambda'$  = the longitude of the same body referred to the mean equinox of the beginning of the Besselian fictitious year.

$\psi_1$  = the adopted value of the general precession.

$\delta'\psi$  = the principal term of the nutation in longitude; or, in other words, the correction to be applied to the longitude of a body referred to the mean equinox of date, in order to obtain that longitude as referred to the true equinox, exclusive of short period terms. When the correction is positive, the longitudes referred to the true equinox are greater than those referred to the mean equinox; while the contrary is the case when the correction has a negative sign.

$\delta''\psi$  = the short period terms of nutation in longitude, given on pages 287-288.

$\omega$  = the true or apparent obliquity of the ecliptic at the date.

$\omega'$  = the mean obliquity of the ecliptic at the beginning of the Besselian fictitious year.

$\delta'\omega$  = the principal term of the nutation of the obliquity of the ecliptic; or, in other words, the correction to be applied to the mean obliquity of date in order to find the true or apparent obliquity, exclusive of short period terms. This quantity is tabulated on page 286, and is positive or negative according as the true obliquity is greater or less than the mean obliquity.

$\delta''\omega$  = the short period terms of nutation in obliquity, given on pages 287–288.

$\tau$  = the fraction of a year intervening between the instant when the Sun's mean longitude was  $280^\circ$  and the date for which  $\lambda$  or  $\omega$  is required.

Then

$$\lambda = \lambda' + \tau \psi_1 + \delta'\psi + \delta''\psi$$

$$\omega = \omega' - 0''.464\tau + \delta'\omega + \delta''\omega$$

Page 286 contains, for each fifth Greenwich mean noon throughout the year, certain quantities which may be described in terms of the above notation as follows: The *Precession in Longitude from 1907.0*  $= \tau \psi_1$ ; the *Nutation in Longitude*  $= \delta'\psi$ ; the *Nutation in Right Ascension*  $= (\delta'\psi) \cos \omega'$ ; the *Nutation in Obliquity*  $= \delta'\omega$ , and the *Obliquity of the Ecliptic*  $= \omega - \delta''\omega$ , which is the true inclination of the Earth's equator to the ecliptic, exclusive of the terms depending on the Moon's longitude.

Pages 287–288 contain the values of  $\delta''\psi$  and  $\delta''\omega$ , which are not included in the values of nutation given on page 286.

## PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 290 contains formulæ for reducing the positions of fixed stars, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of STRUVE and PETERS, and expressed in the notation of BESSEL.

Pages 291–294 contain the logarithms of the *Besselian Star-Numbers*,  $A, B, C, D$ , for each Washington mean midnight, with the values of  $E$  appended at the bottoms of the pages. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given, and in ordinary cases four-figure logarithms suffice; but where extreme accuracy is desired the logarithms of  $A, C$ , and  $D$  are sometimes needed to five places of decimals. If used in accordance with the English and French notation, the pair of quantities  $A$  and  $B$  must be interchanged with the pair  $C$  and  $D$ ; that is,  $A$  must be interchanged with  $C$ , and  $B$  with  $D$ . Along with the solar day, the first column contains the sidereal hour of Washington mean midnight for certain dates, and by interpolation among them it is easy to find the sidereal time for which any set of quantities is given.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:—

*Computation of the apparent place of  $\alpha$  Cygni for 1907, July 30, for the upper transit at Washington.*

$\log a$	0.3594	$\log b$	8.4613	$\log c$	8.6906	$\log d$	8.8222 <i>n</i>
$\log A$	9.4462	$\log B$	0.5520	$\log C$	1.0510	$\log D$	1.2139 <i>n</i>
$\log a'$	1.0760	$\log b'$	9.9055	$\log c'$	9.9163	$\log d'$	9.5446
$\log A a$	9.8056	$\log B b$	9.0133	$\log C c$	9.7416	$\log D d$	0.0361
$\log A a'$	0.5222	$\log B b'$	0.4575	$\log C c'$	0.9673	$\log D d'$	0.7585 <i>n</i>
<hr/>							
<i>Mean Place, 1907.0,</i>	$a_0$	$=$	<sup>h</sup> 20 <sup>m</sup> 25 <sup>s</sup> 47.564	$\delta_0$	$=$	<sup>°</sup> 36 <sup>'</sup> 8 <sup>"</sup> 38.31	
	$A a$	$=$	+ 0.639	$A a'$	$=$	+ 3.33	
	$B b$	$=$	+ 0.103	$B b'$	$=$	+ 2.87	
	$C c$	$=$	+ 0.552	$C c'$	$=$	+ 9.27	
	$D d$	$=$	+ 1.087	$D d'$	$=$	— 5.73	
	$E$	$=$	— 0.003	$\tau \mu'$	$=$	0.00	
	$\tau \mu$	$=$	0.000				
<hr/>							
<i>Apparent Place, July 30,</i>	$a$	$=$	<sup>h</sup> 20 <sup>m</sup> 25 <sup>s</sup> 49.942	$\delta$	$=$	<sup>°</sup> 36 <sup>'</sup> 8 <sup>"</sup> 48.05	

Pages 295–302 contain the *Independent Star-Numbers*, which can frequently be advantageously used instead of the *Besselian Star-Numbers*. These quantities are connected



with those of BESSEL by the relations given on page 290, which also contains the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants,  $a, b, c, d, a', b', c', d'$ , while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four-figure logarithms usually suffice, but where extreme accuracy is desired the logarithms of  $g$  and  $h$  are needed to five places of decimals, and  $G$  and  $H$  are needed to one-tenth of a minute of arc. The column  $\tau$  gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:—

*Computation of the apparent place of  $\alpha$  Cygni for 1907, July 30, for the upper transit at Washington.*

	$a_0 = 306\ 26.9$		$\delta_0 = +\ 36\ 8.6$	
	$G = 32\ 27.8$		$G + a_0 = 338\ 54.7$	
	$H = 145\ 29.6$		$H + a_0 = 91\ 56.5$	
$\log \tau$	8.8239	$\log \tau$	8.8239	$a_0 =$ <sup>h m s</sup> 20 25 47.564
$\log g$	0.8222	$\log h$	1.2979	$f =$ <sup>+</sup> 0.856
$\sin (G + a_0)$	9.5560 <i>n</i>	$\sin (H + a_0)$	9.9997	$(g) =$ <sup>-</sup> 0.116
$\tan \delta$	9.8635	$\sec \delta$	0.0928	$(h) =$ <sup>+</sup> 1.638
$\log (g)$	9.0656 <i>n</i>	$\log (h)$	0.2143	$\tau \mu =$ 0.000
				$a =$ <sup>h m s</sup> 20 25 49.942
$\log g$	0.8222	$\log h$	1.2979	$\delta_0 = +\ 36\ 8\ 38.31$
$\cos (G + a_0)$	9.9698	$\cos (H + a_0)$	8.5300 <i>n</i>	$(g') =$ <sup>+</sup> 6.19
$\log (g')$	0.7920	$\sin \delta$	9.7707	$(h') =$ <sup>-</sup> 0.40
		$\log (h')$	9.5986 <i>n</i>	$(i) =$ <sup>+</sup> 3.94
				$\tau \mu' =$ 0.00
$\log i$	0.6883			$\delta = +\ 36\ 8\ 48.04$
$\cos \delta$	9.9072			
$\log (i)$	0.5955			

Page 303 contains for every tenth sidereal day the *Besselian* and *Independent Star-Numbers*, exclusive of all short period terms. They are useful in computing ephemerides of stars, similar to those on pages 324–399, for which constants containing short period terms should not be employed.

Pages 304–311 contain the mean places of three hundred and eighty-three stars, for the beginning of the Besselian fictitious year 1907, or, in other words, for the moment when the Sun's mean longitude is  $280^\circ$ . The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

Pages 312–323 contain the apparent positions of the five circumpolar stars,  $\alpha, \beta, \delta$  and  $\lambda$  Ursæ Minoris, and  $\gamma$  Cephei, for every upper transit at Washington. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 312, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But the lower transit following that of July 1 (page 318) does not take place until July 2.3. Hence, the lower transit of July 1 precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column *Mean Solar Date*.

Pages 324–399 contain, for every tenth upper transit at Washington, the apparent places of 378 stars, being all those given in the list of mean places, except the five circumpolars. The mean solar date in the left-hand column of each page gives the day and

tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each co-ordinate are given for every ten days.

Pages 400-407 contain the apparent right ascension and declination of the Sun, both for Washington mean and apparent noon, and the hourly motion of the Sun in these co-ordinates; the equation of time, the semidiameter of the Sun, and the sidereal time of semidiameter passing the meridian, for Washington apparent noon; and lastly, the sidereal time of mean noon. The hours and minutes of right ascension and the degrees and minutes of declination are always made the same for both mean and apparent noon. In cases where they really differ, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that the sum of the two remains correct. The hourly motions in right ascension and declination are given for the columns headed *Mean Noon*, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich*.

Pages 408-415 contain the right ascension, declination, semidiameter, and parallax of the Moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the Moon's center over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington would exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the Moon in right ascension were uniform, or, in other words, they are differential coefficients corresponding to the instants of Washington transit. By means of them, when second differences are taken into account, the position of the Moon can be computed with great exactness for the moment of transit over any meridian not more than one hour distant from Washington. To obtain the same accuracy for more distant meridians, we may proceed as follows: Let  $F$  represent either the *Mean Time of Transit*, the *Right Ascension of Center*, or the *Geocentric Declination of Center*, and let  $D$  represent the corresponding *Difference for One Hour of Longitude*. Write down three successive values of  $F$ , together with the corresponding values of  $D$ , and difference the latter as in the following scheme; where the middle values,  $F_0$  and  $D_0$ , belong to the Washington culmination from which is to be derived the value of  $F$  for the culmination on the meridian whose longitude is  $\lambda$  :—

Function.	Diff. for 1 Hour of Longitude.	$\Delta'$	$\Delta''$
$F_{-1}$	$D_{-1}$	$a'$	$b$
$F_0$	$D_0$	$a''$	
$F_{+1}$	$D_{+1}$		

Then, for the culmination at the meridian  $\lambda$

$$F_{\lambda} = F_0 + \lambda D_0 + \frac{\lambda^2}{96} (a' + a'') + \frac{\lambda^3 b}{3456}$$

where  $\lambda$  must be expressed in hours and decimals of an hour, and is to be taken plus or minus according as the longitude from Washington is west or east

The columns of *Sidereal Time of Semidiameter passing Meridian*, *Geocentric Semidiameter* and *Equatorial Horizontal Parallax*, do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within  $0''.05$  of the opposite limb, both can be well observed, and in such cases both are indicated.

Pages 416-434 contain the geocentric apparent right ascensions and declinations of the seven major planets, together with their horizontal parallaxes, semidiameters, and sidereal times of semidiameters passing the meridian, for the moments of all transits which it is usually desirable to observe over the meridian of Washington. The columns following the dates give the Washington mean times of these transits.

### PART III—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Washington mean time, except in the case of the eclipses and the data for the rings of Saturn, which are expressed in Greenwich mean time.

Pages 436-442 contain all necessary data respecting the solar and lunar eclipses and a transit of Mercury which occur during the year.

The eclipse elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse remain the same throughout all parts of the Earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical diameter of the Earth's shadow has been augmented in the proportion of 51 : 50. The principal circumstances of each total and annular solar eclipse are stated on five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, and the latitude and longitude of the point of contact follow.

The line entitled "Central eclipse at noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane. The latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface follow, and there the eclipse will be central and the Sun will be exactly on the meridian.

The lines entitled "Central eclipse ends" and "Eclipse ends" give respectively the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

*Maps of the Eclipses.*—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outline of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding

hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for the changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of 1907, January 13, begins and ends at the place whose latitude is  $40^{\circ}$  N. and whose longitude is  $100^{\circ}$  E.

For the beginning we compare the distance of the place from the curves of  $17^{\text{h}}$  and  $18^{\text{h}}$ , and find it to correspond to about 9 minutes from the former, thus giving for the approximate time of beginning  $17^{\text{h}} 9^{\text{m}}$ ; for the end we compare the distance of the place from the curves of  $19^{\text{h}}$  and  $20^{\text{h}}$ , and find it to be about 54 minutes from the former, thus giving for the approximate time of ending  $19^{\text{h}} 54^{\text{m}}$ , and both of these results are probably correct to within 3 or 4 minutes. Changing to local mean time, we shall have—

	Beginning.			Ending.		
	d	h	m	d	h	m
Greenwich mean time . . . . .	Jan. 13	17	9	13	19	54
Longitude east . . . . .		6	40		6	40
Local mean time . . . . .	Jan. 13	23	49	14	2	34

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relatively to the central line and to the limit. On the central line, the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit; the measurements being made upon a line drawn through the place, perpendicularly to the central line.

*More Accurate Computations.*—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements which are given for every 10 minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of  $xy$ . We take the intersection of this plane with that of the Earth's equator as the axis of  $x$ , and the center of the Earth as the origin of co-ordinates. The axis of  $y$  is perpendicular to that of  $x$ , and directed toward the north;  $x$  and  $y$  are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle  $d$ , of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle  $\mu$  is the Greenwich hour angle of this same point of the celestial sphere.

The quantities  $l_1$  and  $l_2$  are the radii of the shadow cones upon the fundamental plane,  $l_1$  corresponding to the penumbra, and  $l_2$  to the umbra, or annulus. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which  $l_2$  is regarded as positive for an annular, and negative for a total eclipse.

The angles  $f_1$  and  $f_2$ , the tangents of which are given, are the angles which the elements of the respective shadow cones make with the axis of the shadow; or, they are the semi-angles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of  $x'$ ,  $y'$ , and  $\mu'$ , which are the changes of  $x$ ,  $y$ , and  $\mu$ , in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that at the moments of beginning and ending the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find this distance and radius we proceed as follows:—

(1) The co-ordinates of the observer,  $\xi$ ,  $\eta$ , and  $\zeta$ , together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The co-ordinates  $x$  and  $y$  of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find  $\rho \cos \varphi'$  and  $\rho \sin \varphi'$ , which are the geocentric co-ordinates of the station referred to the Earth's equator,  $\rho$  being the distance from the center of the Earth, and  $\varphi'$  the geocentric latitude. These co-ordinates may be obtained from geodetic tables, or may be computed from the following table based on CLARKE'S spheroid of 1866, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

$\varphi$  being, as usual, the geographic latitude.

*Table for Computing the Geocentric Co-ordinates of a Place.*

$\varphi$	Log F.	Log G.
0°	0.00000	0.00295
5	0.00001	0.00294
10	0.00004	0.00291
15	0.00010	0.00285
20	0.00017	0.00278
25	0.00026	0.00269
30	0.00037	0.00258
35	0.00048	0.00247
40	0.00061	0.00234
45	0.00074	0.00221
50	0.00086	0.00209
55	0.00099	0.00196
60	0.00111	0.00184
65	0.00121	0.00174
70	0.00130	0.00165
75	0.00138	0.00157
80	0.00143	0.00152
85	0.00146	0.00149
90	0.00147	0.00147

For the assumed Greenwich mean time of computation, take from the table of elements the values of  $\sin d$ ,  $\cos d$ , and  $\mu$ . Then, with  $\lambda$  for the longitude west from Greenwich, the co-ordinates of the observer will be—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$

$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2$$

$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2$$

and their variations in one minute of mean time will be—

$$\begin{aligned}\xi' &= [7.63992] \rho \cos \varphi' \cos (\mu - \lambda) \\ \eta' &= [7.63992] \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992] \xi \sin d \\ \zeta' &\text{ is not needed.}\end{aligned}$$

(2) For the same assumed moment of Greenwich mean time, take from the tables of elements the co-ordinates  $x$  and  $y$  of the axis of the shadow, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. These variations are represented by  $x'$  and  $y'$ , and their logarithms are given beneath the tables of  $x$  and  $y$ .

(3) The distance  $m$  and position-angle  $M$  of the axis of the shadow relatively to the observer, and the relative motions,  $n$  and  $N$ , are computed by the formulæ—

$$\begin{aligned}m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta'\end{aligned}$$

(4) Both for the shadow and for the penumbra, the radius  $L$  at the distance  $\zeta$  from the fundamental plane is computed by the formula—

$$L = l - \zeta \tan f$$

$l$  and  $f$  being found from the table of elements, and  $\zeta$  computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ending of the eclipse, we shall have—

$$m = L$$

But, as this condition will rarely be fulfilled on a first trial, a correction  $\tau$  to the assumed time is computed thus: Find the angle  $\psi$  from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values for this angle, of which one will be in the first and the other in the second quadrant when  $\sin \psi$  is positive, and one in the third and the other in the fourth quadrant when  $\sin \psi$  is negative; but simplicity will be gained by taking only that value of  $\psi$  for which  $\cos \psi$  is positive. This value lies between the limits  $+90^\circ$  and  $-90^\circ$ . The correction  $\tau$  to the assumed time of beginning or ending of the eclipse will then be found, in minutes, from—

$$\tau = - \frac{m \cos (M - N)}{n} \mp \frac{L \cos \psi}{n}$$

where the double sign is to be taken negative for the beginning and positive for the ending.

However, one such pair of values of  $\tau$  can not give the times of both beginning and ending with accuracy. To attain that, we must commence the computation by assuming two times, one near the beginning, and the other near the ending of the eclipse; both of which may be derived from the chart with sufficient exactness. The computation for the first assumed time will give a small value of  $\tau$  which, when applied to the assumed time, will give the beginning of the eclipse nearly correctly, and a large value which will give an inaccurate time of ending. Similarly the computation for the second assumed time will give a small and nearly correct value of  $\tau$ , for finding the time of ending, and a large and inaccurate negative value for finding the time of beginning. We shall thus deduce two times of each phase, only one of which is to be regarded as approximately correct.

The more accurate times of beginning and ending may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a pair of values of  $\tau$ , which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors, but a second

approximation may be obtained without it, by finding a corrected value of  $\tau$  in accordance with the formulæ—

$$\delta\tau = \mp \frac{\tau (l' + [5.3100] \xi \cos d)}{n \cos \psi} - \frac{[4.9788] \tau^2}{n \cos \psi} [\xi \sin (N \mp \psi) - \eta_2 \cos (N \mp \psi)]$$

$$\tau_0 = \tau + \delta\tau$$

where the double signs are to be taken negative for the beginning of the eclipse and positive for the ending.  $l'$  is the variation of  $l$  for one minute of time, and its numerical value can be taken by inspection from the table of Besselian elements.

If the resulting values of  $\tau_0$  are not greater than fifteen minutes, the corrected times of contact thus obtained will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction. To guard against numerical mistakes it is better, after making this final correction, to repeat the computations so far as to obtain new values of  $m$  and  $L$  for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, the computer must use his own judgment as to making further corrections and computations.

*Position-angle of Point of Contact.*—The position-angle  $P$ , of the point of contact, reckoned from the north point of the Sun's limb toward the east, is found by the formula—

$$P = N - \psi \pm 180^\circ \text{ for the beginning,}$$

$$P = N + \psi \quad \text{for the ending,}$$

it being assumed that, in each case, the value of  $\psi$  is taken between the limits  $\pm 90^\circ$

*Computation of the Solar Eclipse of 1907, January 13, for Bombay.*

The position of Bombay is—

$$\begin{aligned} \text{Latitude, } \phi &= + 18^\circ 53' 45'' \\ \text{Longitude, } \lambda &= - 72^\circ 48' 56'' \end{aligned}$$

and its geocentric co-ordinates are—

$$\begin{aligned} \rho \sin \phi' &= 9.50755 \\ \rho \cos \phi' &= 9.97610 \end{aligned}$$

From the Eclipse Charts we find the approximate times of the phases to be—

	d	h	m		Beginning.	Ending.
					16 <sup>h</sup> 10 <sup>m</sup>	18 <sup>h</sup> 50 <sup>m</sup>
Beginning January	13	16	10	} Greenwich Mean Time.		
Ending	13	18	50			
Greenwich Mean Time, $T$ ,	January 13					
	$\mu$				240 18 0	280 17 36
	$\lambda$				- 72 48 56	- 72 48 56
	$\mu - \lambda$				313 6 56	353 6 32
	$\rho \cos \phi'$				9.97610	9.97610
	$\sin (\mu - \lambda)$				9.86331 <i>n</i>	9.07912 <i>n</i>
	$\log \xi$				9.83941 <i>n</i>	9.05522 <i>n</i>
	$\xi$				- 0.69089	- 0.11356
	$\rho \sin \phi'$				9.50755	9.50755
	$\cos d$				9.96864	9.96869
	$\log \eta_1$				9.47619	9.47624
	[Eph 07]					

Greenwich Mean Time, $T$ , January 13	Beginning. 16 <sup>h</sup> 10 <sup>m</sup>	Ending. 18 <sup>h</sup> 50 <sup>m</sup>
$\eta_1$	+ 0.29936	+ 0.29939
$\rho \cos \varphi'$	9.97610	9.97610
$\sin d$	9.56435 $n$	9.56399 $n$
$\cos (\mu - \lambda)$	9.83472	9.99685
$\log \eta_2$	9.37517 $n$	9.53694 $n$
$\eta_2$	- 0.23723	- 0.34430
$\eta = \eta_1 - \eta_2$	+ 0.53659	+ 0.64369
$\rho \sin \varphi' \sin d$	9.07190 $n$	9.07154 $n$
$\zeta_1$	- 0.11801	- 0.11791
$\rho \cos \varphi' \cos d \cos (\mu - \lambda)$	9.77946	9.94164
$\zeta_2$	+ 0.60181	+ 0.87426
$\zeta = \zeta_1 + \zeta_2$	+ 0.48380	+ 0.75635
const. log	7.63992	7.63992
$\rho \cos \varphi' \cos (\mu - \lambda)$	9.81082	9.97295
$\log \xi'$	7.45074	7.61287
$\xi'$	+ 0.002823	+ 0.004101
const. log	7.63992	7.63992
$\xi \sin d$	9.40376	8.61921
$\log \eta'$	7.04368	6.25913
$\eta'$	+ 0.001106	+ 0.000182
$x - \xi$	- 0.47856	+ 0.47765
$y - \eta$	+ 0.24631	+ 0.24669
$x' - \xi'$	+ 0.006761	+ 0.005483
$y' - \eta'$	- 0.000439	+ 0.000495
$m \sin M$	9.67993 $n$	9.67911
$m \cos M$	9.39148	9.39215
$\tan M$	0.28845 $n$	0.28696
$M$	297° 14' 4"	62° 41' 8"
$\sin M$	9.94898 $n$	9.94866
$\log m$	9.73095	9.73045
$n \sin N$	7.83001	7.73902
$n \cos N$	6.64246 $n$	6.69461
$\tan N$	1.18755 $n$	1.04441
$N$	93° 42' 54"	84° 50' 29"
$\sin N$	9.99909	9.99823
$\log n$	7.83092	7.74079
$\tan f$	7.67701	7.67701
$\log \zeta$	9.68467	9.87872
	7.36168	7.55573
$\zeta \tan f$	+ 0.00230	+ 0.00360
$l$	+ 0.54067	+ 0.54089
$L$	+ 0.53837	+ 0.53729
$M - N$	203° 31' 10"	337° 50' 39"
$\sin (M - N)$	9.60104 $n$	9.57649 $n$
$\log m$	9.73095	9.73045
$\csc L$	0.26892	0.26979
$\sin \phi$	9.60091 $n$	9.57673 $n$



Greenwich Mean Time, $T$ ,	January 13	Beginning. 16 <sup>h</sup> 10 <sup>m</sup>	Ending. 18 <sup>h</sup> 50 <sup>m</sup>
$\psi$		— 23° 30' 44"	— 22° 10' 8"
$\log \frac{m}{n}$		1.90003	1.98966
$\cos (M - N)$		9.96233 $n$	9.96668
		1.86236 $n$	1.95634
$-\frac{m}{n} \cos (M - N)$		+ 72.838	— 90.436
$\log L$		9.73108	9.73021
$\cos \psi$		9.96236	9.96664
$\csc \psi$		2.16908	2.25921
		1.86252	1.95606
$\mp \frac{L \cos \psi}{n}$		— 72.865	+ 90.378
		$m$	$m$
$\tau$		— 0.027	— 0.058
		$h$ $m$	$h$ $m$
$T$		16 10	18 50
$T + \tau$		16 9.973	18 49.942
$\lambda$		— 4 51.262	— 4 51.262
Local Mean Time, January		13 <sup>d</sup> 21 <sup>h</sup> 1 <sup>m</sup> .235	13 <sup>d</sup> 23 <sup>h</sup> 41 <sup>m</sup> .204

No correction is necessary, since the assumed times differ very little from the computed ones.

Therefore we have—

Beginning of the eclipse, January 13<sup>d</sup> 21<sup>h</sup> 1<sup>m</sup> 14.1 } Local Mean Time.  
End of the eclipse, " 13 23 41 12.2 }

	Beginning.	Ending.
$N \mp \psi$	117 13.6	62 40.4
constant	+180 0.0	0 0.0
Angle of position: $P$	297 13.6	62 40.4

from the north point of the Sun's disk toward the east for direct image.

*Moon's Phases, Libration, etc.*—Page 443 gives the Washington mean times of the Moon's phases, apogee, perigee and greatest libration, together with the formulæ for finding the libration in longitude and latitude whenever required.

*Mean Places of Stars Occulted During the Year.*—Pages 444-447 contain, for the year 1907, the adopted mean places and annual proper motions, of such stars as will be occulted by the Moon, but are not included in the list given on pages 304-311. These additional stars are necessary in order to provide each month a sufficient number brighter than the 6.55 magnitude which will be occulted at a distance of more than 25° from the Sun.

*Elements of Occultations.*—Pages 448-480 give the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of co-ordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red ns* from 1907.0 give the quantities

necessary to reduce the mean place of the star at the beginning of 1907 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:—

The *Washington Mean Time* is the moment,  $T$ , at which the two bodies are in geocentric conjunction in right ascension. At that moment the co-ordinate  $x$  of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle, H*, gives the common geocentric hour angle of the Moon and star at the same moment, expressed in sidereal time and counted from the meridian of Washington—positive toward the west and negative toward the east. Column  $Y$  gives the co-ordinate  $y$  of the axis of the cylinder upon the fundamental plane at the same moment. Columns  $x'$  and  $y'$  give the variations of  $x$  and  $y$  in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star relatively to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as that already explained for computing eclipses, but somewhat more simple.

*Prediction of Occultations for a Given Place.*—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.
2. The quantity  $H - \lambda$ , taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east, or an immersion in the west, when this difference is a few minutes less than an hour.
3. The Sun must not be much more than an hour above the horizon at the local mean time  $T - \lambda$ , unless the star is bright enough to be seen in the daytime.

When many occultations are to be selected, the most convenient course will be to write the value of  $-\lambda$  on the bottom of a slip of paper, and in passing through the list of occultations, to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether  $H - \lambda$  or  $T - \lambda$  falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

$T$  = the instant of geocentric conjunction of Moon and star in right ascension, expressed in Washington mean solar time;

$H$  = the Washington west hour angle of the two bodies at that moment;

$\lambda$  = the longitude west of Washington;

$h_0 = H - \lambda$  = the local hour angle of the star at the instant  $T$ ;

$\delta$  = the star's declination.

The procedure for each occultation will then be as follows:—

(1) The geocentric co-ordinates of the place,  $\rho \sin \varphi'$  and  $\rho \cos \varphi'$ , are to be computed by the formulæ and table given in connection with eclipses on page 571.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of

geocentric conjunction by the application of an approximate correction taken from Mr. DOWNES's table, printed in the volumes of the American Ephemeris for 1882 to 1899. This correction must be reckoned in mean solar hours, and will be designated by the symbol  $t$ . It will have the same sign as  $h_0$ .

When DOWNES's table is not available, the correction may be computed from the formulæ,

$$\begin{aligned}\xi_0 &= \rho \cos \varphi' \sin h_0 \\ \xi' &= [9.4192] \cos \frac{4}{3} h_0 \\ t &= \frac{\xi_0}{x' - \xi'}\end{aligned}$$

By applying  $t$  to the Washington mean time of geocentric conjunction, as given with the elements, we shall have the Washington mean time of local conjunction within a few minutes.

(2) Compute for the instant  $T+t$  the following quantities, in which  $t_0$  is the sidereal equivalent of the mean time interval  $t$ :

$$\begin{aligned}\xi &= \rho \cos \varphi' \sin (h_0 + t_0) \\ \eta &= \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta \cos (h_0 + t_0) = \eta_1 - \eta_2 \\ \xi' &= [9.4192] \rho \cos \varphi' \cos (h_0 + t_0) \\ \eta' &= [9.4192] \rho \cos \varphi' \sin \delta \sin (h_0 + t_0) = [9.4192] \xi \sin \delta \\ x &= x't \\ y &= Y + y't\end{aligned}$$

Compute also  $m$ ,  $M$ ,  $n$ ,  $N$ , and  $\psi$  from the equations

$$\begin{aligned}m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta' \\ \sin \psi &= [0.5646] m \sin (M - N)\end{aligned}$$

$\psi$  being taken between the limits  $\pm 90^\circ$ . Finally compute

$$\begin{aligned}\tau &= -\frac{[1.7782]m}{n} \cos (M - N) \mp \frac{[1.2135]}{n} \cos \psi \\ \delta\tau &= \frac{[6.7591]\tau^2}{n \cos \psi} [\eta_2 \cos (N \mp \psi) - \xi \sin (N \mp \psi)]\end{aligned}$$

where the double signs are to be taken negative for an immersion and positive for an emersion. Both  $\tau$  and  $\delta\tau$  thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated respectively  $\tau'$  and  $\delta\tau'$ , while those pertaining to emersion are designated  $\tau''$  and  $\delta\tau''$ . We then have for the Washington mean times of the phases

$$\begin{aligned}\text{Instant of immersion} &= T + t + \tau' + \delta\tau' \\ \text{Instant of emersion} &= T + t + \tau'' + \delta\tau''\end{aligned}$$

These expressions are practically exact, as the corrections  $\delta\tau$  seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results, it will be advisable to compute  $\xi$ ,  $\eta$ ,  $x$ , and  $y$  for the times of immersion and emersion finally obtained. If these times are correct the quantities in question will fulfill the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2725$$

[Eph 07]

If  $\log m \sin (M - N) > 9.4354$ ,  $\sin \psi$  will be numerically greater than unity, and no occultation is to be expected at the given place; but a very brief one may occur if the excess of the computed distance over the Moon's semidiameter happens to be within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol  $P$ . It is computed from the formula,

$$\begin{aligned} P &= N - \psi + \delta P && \text{for immersion,} \\ P &= N + \psi + \delta P \pm 180^\circ && \text{for emersion,} \end{aligned}$$

where the angles  $N - \psi$  and  $N + \psi$  are taken directly from the computation of  $\delta\tau$ , and  $\delta P$  is found in degrees of arc from the expression

$$\delta P = \mp \frac{[7.3038]\tau^2}{\cos \psi} [\eta_2 \sin N + \xi \cos N]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex,  $V$ , is also reckoned in the direction from the north toward the east, and is found from the formula,

$$V = P - C$$

where  $C$  is computed from the expression

$$\tan C = \frac{\xi + [8.2218]\tau\xi' - [4.9810]\tau^2\xi}{\eta + [8.2218]\tau\eta' + [4.9810]\tau^2\eta_2}$$

$C$  being taken less or greater than  $180^\circ$ , according as the numerator is positive or negative.

The value of  $\tau$  employed in the latter formula must be so taken as to correspond with the phase for which  $C$  is required.

In the volumes of the American Ephemeris for the years 1882 to 1901 instructions are given for constructing three special tables which greatly diminish the labor of computing occultations, but as these tables should contain from 4 700 to 6 300 quantities, and as they would apply only to the place for which they were computed, it will rarely be worth while to undertake the labor of forming them. Those who desire further information on the subject may consult any one of the volumes in question.

As an example of an isolated occultation, we will compute that of  $\delta$  Cancri on March 24, 1907, for Denver, whose position is—

$$\begin{aligned} \varphi &= + 39^\circ 40' 36''.4 \\ \lambda &= + 1^h 51^m 31^s.8 \end{aligned}$$

and whose geocentric co-ordinates are—

$$\begin{aligned} \rho \sin \varphi' &= 9.8028 \\ \rho \cos \varphi' &= 9.8869 \end{aligned}$$

From the elements on page 455, we have

$$\begin{aligned} T &= 10^h 22.9^m \\ H &= + 1^h 49.3^m \end{aligned}$$

and

$$h_0 = H - \lambda = - 0^h 2.2^m$$

From the formulæ on page 577, we find the correction,  $t$ , to the Washington mean time of geocentric conjunction,  $T$ , to be about  $-0^h 1^m.6$ ; therefore the Washington mean time of apparent conjunction is—

$$T + t = \text{March } 24^d 10^h 21^m.3.$$

[Eph 07]

$\delta$ Cancr.	Apparent Declination.	W. T. of $\delta$	Hour angle.	$Y$	$x'$	$y'$
	$^{\circ}$ + 18 29.7	$d$ $h$ $m$ March 24 10 22.9	$h$ $m$ + 1 49.3	+ 0.5900	0.5483	- 0.0939

$T + t$	March 24 <sup>d</sup> 10 <sup>h</sup> 21 <sup>m</sup> .3	$x - \xi$	- 0.00184
$h_0$	- 0 2.2	$y - \eta$	+ 0.2347
$t_0$	- 0 1.6	$x' - \xi'$	+ 0.3460
$h_0 + t_0$ (in arc)	- 0° 57'.0	$y' - \eta'$	- 0.0928
$\rho \cos \varphi'$	9.8869	$m \sin M$	7.2648 $n$
$\sin (h_0 + t_0)$	8.2196 $n$	$m \cos M$	9.3705
$\log \xi$	8.1065 $n$	$\tan M$	7.8943 $n$
$\xi$	- 0.01278	$M$	359° 33'
$\rho \sin \varphi'$	9.8028	$\cos M$	0.0000
$\cos \delta$	9.9770	$\log m$	9.3705
$\log \eta_1$	9.7798	$n \sin N$	9.5391
$\eta_1$	+ 0.6023	$n \cos N$	8.9675 $n$
$\rho \cos \varphi'$	9.8869	$\tan N$	0.5716 $n$
$\sin \delta$	9.5014	$N$	105° 1'
$\cos (h_0 + t_0)$	9.9999	$\sin N$	9.9849
$\log \eta_2$	9.3882	$\log n$	9.5542
$\eta_2$	+ 0.2445	const. log	0.5646
$\eta_1 - \eta_2 = \eta$	+ 0.3578	$\log m$	9.3705
const. log	9.4192	$\sin (M - N)$	9.9840 $n$
$\rho \cos \varphi' \cos (h_0 + t_0)$	9.8868	$\sin \psi$	9.9191 $n$
$\log \xi'$	9.3060	$\psi$	303° 54'
$\xi'$	+ 0.2023	const. log	1.7782 $n$
const. log	9.4192	$\log \frac{m}{n}$	9.8163
$\xi \sin \delta$	7.6079 $n$	$\cos (M - N)$	9.4260 $n$
$\log \eta'$	7.0271 $n$		1.0205
$\eta'$	- 0.00106	$-\frac{[1.7782]}{n} m \cos (M - N)$	+ 10.48
$\log x'$	9.7390	const. log	1.2135
$\log t$	8.4260 $n$	colog $n$	0.4458
$\log x$	8.1650 $n$	$\cos \psi$	9.7464
$x$	- 0.01462		1.4057
$\log y'$	8.9727 $n$	$\mp \frac{[1.2135]}{n} \cos \psi$	$\mp 25.45$
$\log y' t$	7.3987	$\tau$ for immersion	- 14.97
$y' t$	+ 0.0025	$\tau$ for emersion	+ 35.93
$Y$	+ 0.5900		
$y$	+ 0.5925		

The computation of  $\delta\tau$  for the two contacts is as follows:

	Immersion.	Emersion.
$N \mp \psi$	161° 7'	48° 55'
$\cos (N \mp \psi)$	9.9760 $n$	9.8177
$\log \eta_2$	9.3882	9.3882
$\log (1)$	9.3642 $n$	9.2059

	Immersion.	Emersion.
(1)	— 0.2313	+ 0.1607
$\sin (N \mp \psi)$	9.5101	9.8772
$\log \xi$	8.1065 <i>n</i>	8.1065 <i>n</i>
$\log (2)$	7.6166 <i>n</i>	7.9837 <i>n</i>
(2)	— 0.0041	— 0.0096
(1) — (2)	— 0.2272	+ 0.1703
$\log [(1) - (2)]$	9.3564 <i>n</i>	9.2312
const. log	6.7591	6.7591
$\log \tau^2$	2.3504	3.1109
$\text{colog } (n \cos \psi)$	0.6994	0.6994
$\log \delta\tau$	9.1653 <i>n</i>	9.8006
$\delta\tau$	— 0.15	+ 0.63
$\tau + \delta\tau$	— 15.12	+ 36.56
$T + t$	March <sup>d h m</sup> 24 10 21.3	<sup>h m</sup> 10 21.3
Washington Mean Time of Phase,	" <sup>d h m</sup> 24 10 6.2	10 57.9
$\lambda$	+ 1 51.5	1 51.5
Denver Mean Time,	" <sup>d h m</sup> 24 11 57.7	12 49.4
To find $\delta P$ and $P$ :		
$\log \eta_s$ 9.3882	$\log \xi$ 8.1065 <i>n</i>	(3) + 0.2361
$\sin N$ 9.9849	$\cos N$ 9.4135 <i>n</i>	(4) + 0.0033
$\log (3)$ 9.3731	$\log (4)$ 7.5200	(3) + (4) + 0.2394
$\log [(3) + (4)]$	Immersion.	Emersion.
const. log	9.3793	9.3793
$\log \tau^2$	7.3038 <i>n</i>	7.3038
$\text{colog } \cos \psi$	2.3504	3.1109
$\log \delta P$	0.2536	0.2536
$\delta P$	9.2871 <i>n</i>	0.0476
$N \mp \psi$	— 0.19	+ 1.12
constant	161.1	48.9
Angle of position:	0.0	+ 180.0
$P$	160.9	230.0

from the north point of the Moon's limb toward the east, for direct image.

*Occultations Visible at Washington*, pages 481-482.—Here are given in detail all the data necessary for observing every occultation of the general list which is visible at Washington during the current year.

*Phenomena of Planets and Satellites*, pages 483-517.—These are, for the most part, sufficiently explained in the body of the work, but the following additional explanations may be of service in some cases:—

*Disks of Mercury, Venus and Mars*, pages 483-485.—The angle  $\theta$ , needed in reducing meridian observations, is the angle which the arc of the great circle from the planet to the Sun makes with the arc from the planet toward the west, reckoned in the direction west, north, east, south. This position-angle is reckoned from  $0^\circ$  to  $360^\circ$ , as in the measurement of double stars, the planet taking the place of the central star, but its measure is  $90^\circ$  greater than in the case of a double star.

We may also regard  $\theta$  as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

*Satellites of Mars*, page 486.—This page gives the diagram and ephemerides of the satellites, together with their position-angles and distances from the center of the planet.

*Satellites of Jupiter*, pages 487–511.—The abbreviations designating the phenomena are explained at the foot of each page; the diagram is on page 487.

*Satellites of Saturn*, pages 512–515.—The explanations are given on pages 512 and 513, the Washington mean times of greatest elongations on pages 513 to 515, and the apparent elements of the rings on page 515.

*Satellites of Uranus*, page 516.—This page gives the diagram and ephemerides of the satellites, together with their position-angles and distances from the center of the planet.

*Satellite of Neptune*, page 517.—This page gives the diagram and ephemerides of the satellite, together with the position-angles and distances from the center of the planet.

*Phenomena*, pages 518–519.—The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are respectively the instants when the longitude of each planet differs from that of the Sun by  $0^\circ$ ,  $\pm 90^\circ$ , or  $180^\circ$ .

For the conjunction of the planets with the Moon, and with each other, the predicted times are the instants when the two bodies have the same right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

*Positions of Observatories*, pages 520–524.—The latest available data have been used in compiling these positions, and many of them have been furnished through the courtesy of the directors of the several observatories in response to a circular issued by this office. The values given for the *Reduction to Geocentric Latitude* and *Log  $\rho$*  are based upon Col. A. R. CLARKE'S elements of the terrestrial spheroid, published in 1866, from which we have—

$$\begin{aligned}\log e &= 8.915\ 2515 \\ \varphi' - \varphi &= -11' \ 40''.44 \sin 2\varphi + 1''.19 \sin 4\varphi \\ \log \rho &= 9.999\ 2645 + 0.000\ 7374 \cos 2\varphi - 0.000\ 0019 \cos 4\varphi\end{aligned}$$

#### PART IV—STAR NUMBERS, APPARENT PLACES OF STARS, AND OTHER DATA, BASED ON THE CONSTANTS OF THE PARIS CONFERENCE OF MAY, 1896.

Page 526 contains the formulæ for reducing the positions of the fixed stars and for computing the star numbers, the whole expressed in terms of the notation of BESSEL and the constants of the PARIS CONFERENCE of May, 1896.

Page 527 contains the usual data for precession, nutation, obliquity of the ecliptic, and the Sun's aberration, all of which will be rendered sufficiently clear by the explanations given on pages 565–566 respecting the similar data on pages 285–286.

Pages 528–531 contain the logarithms of the *Besselian Star-Numbers*  $A$ ,  $B$ ,  $C$ ,  $D$ , for each Washington mean midnight, and pages 532–539 contain the *Independent Star-Numbers* for the same dates; to all of which the explanations given on pages 566–567 apply, except that the formulæ on page 526 must be employed instead of those on page 290.

Pages 540–551 contain the apparent positions of the five circumpolar stars,  $\alpha$ ,  $\beta$ ,  $\delta$ , and  $\lambda$  Ursæ Minoris and  $\gamma$  Cephei, for their upper transit at Washington. The arrangement of the data is the same as on pages 312–323, and consequently the explanations given on page 567 apply here also.

Pages 552–556 contain, for every tenth upper transit at Washington, the apparent places of 25 stars, being all those embraced in the list on pages 304–311 whose declina-

tion exceeds  $\pm 78^\circ 30'$ , except the five circumpolar stars. For stars of less declination than  $\pm 78^\circ 30'$  the apparent places derived by using the constants of the PARIS CONFERENCE differ from those derived by using the constants of STRUVE and PETERS by quantities which never exceed  $0''.015$  in right ascension or  $0''.05$  in declination, and consequently, throughout that range, the places given on pages 324-399 may be regarded as correct for either set of constants; or, in other words, when using the constants of the PARIS CONFERENCE the positions of all stars not contained in pages 552-556 may be taken with sufficient accuracy from pages 324-399. The explanation on page 567, respecting the data on pages 324-399, applies also to pages 552-556.

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*Latitude by Observed Altitude of Polaris*, page 595.—Table IV, page 595, replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the EPHEMERIS for 1874 to 1881, and is intended for use at sea and reconnaissance on land. It is constructed upon the assumption that Polaris has a declination of  $+88^\circ 48'.6$ , and an observed altitude of  $45^\circ$ , and will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

The directions for using the table are adapted to an assumed right ascension of  $1^h 25^m.8$  for Polaris, but somewhat greater accuracy may be insured by substituting the right ascension for the date of observation, from pages 312-323 of this volume.

[Eph 07]



# APPENDIX.

## ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1907.

Among American astronomers there are wide differences of opinion respecting the decisions of the PARIS CONFERENCE of May, 1896, and for that reason it has been thought best to give, in the American Ephemeris for 1907, two wholly distinct sets of constants for precession, nutation, aberration, and mean obliquity of the ecliptic, namely: first, those of STRUVE and PETERS, and second, those adopted by the PARIS CONFERENCE of 1896. Their values for 1907.0 are as follows:

	Struve and Peters.	Paris Conference.
Precession . . . . .	50.2654	50.2579
Nutation . . . . .	9.2241	9.21
Aberration . . . . .	20.4451	20.47
Mean Obliquity . . . . .	23° 27' 4".51	23° 27' 4".98

The constants of STRUVE and PETERS are employed in the quantities on pages 286 to 399, and those of the PARIS CONFERENCE in the quantities on pages 526 to 556, and thus everyone is left free to choose between them. For stars distant more than 11° 30' from either pole, the apparent places derived by using the constants of the PARIS CONFERENCE differ from those derived by using the constants of STRUVE and PETERS by quantities which never exceed 0".015 in right ascension, and 0".05 in declination, and consequently throughout that region the star ephemerides given on pages 324 to 399 may be regarded as correct for either set of constants. For the five circumpolar stars, and twenty-five other stars whose declinations exceed  $\pm 78^\circ 30'$  two sets of ephemerides are given; one depending upon the constants of STRUVE and PETERS, and the other depending upon the constants of the PARIS CONFERENCE.

The formulæ for the reduction of stars from mean to apparent place, using the constants of STRUVE and PETERS, are given on page 290.

The nutation given on page 286, and used in the Besselian and independent star-numbers, page 303; in  $f'$ , pages 295 to 302, and in the ephemerides of the apparent places of the fixed stars for every tenth transit, pages 324 to 399, is computed with the values of  $A'$  and  $B'$  given on page 290, while the nutation used in the Besselian and independent star-numbers (except  $f'$ ) given on pages 291 to 302 is computed with the values of  $A$  and  $B$  given on page 290.

In the daily ephemeris of the five circumpolar stars given on pages 312 to 323 the nutation is computed with—

$$\begin{aligned}
 A = & \tau - 0.34254 \sin \Omega \\
 & + 0.00410 \sin 2\Omega \\
 & - 0.02519 \sin 2\odot \\
 & + 0.00293 \sin (\odot + 81^\circ 52') \\
 & + 0.00025 \sin (2\odot - \Omega) \\
 & - 0.00011 \sin (3\odot - \Gamma) \\
 & - 0.00005 \sin 2(\odot - \Omega) \\
 & + 0.00010 \sin 2(\odot - \Gamma') \\
 & + 0.00009 \sin (2I'' - \Omega) \\
 & + 0.00005 \cos \Gamma' \\
 & + 0.00004 \sin 2I'' \\
 & - 0.00405 \sin 2\mathcal{C} \\
 & + 0.00135 \sin (\mathcal{C} - I'')
 \end{aligned}$$

$$\begin{aligned}
 B = & - 9.2241 \cos \Omega \\
 & + 0.0895 \cos 2\Omega \\
 & - 0.5506 \cos 2\odot \\
 & - 0.0092 \cos (\odot + 281^\circ 20') \\
 & - 0.0027 \cos (3\odot - \Gamma) \\
 & + 0.0067 \cos (2\odot - \Omega) \\
 & + 0.0024 \cos (2I'' - \Omega) \\
 & - 0.0023 \sin \Gamma' \\
 & + 0.0008 \cos 2I'' \\
 & - 0.0885 \cos 2\mathcal{C}
 \end{aligned}$$

and the result in right ascension is diminished by the quantity  $f - f' = -0''.1866 \sin 2\zeta + 0''.0622 \sin (\zeta - I'')$ , which is the same for all stars.

The formulæ for the reduction of stars from mean to apparent place, using the constants of the PARIS CONFERENCE, are given on page 526.

The nutation on page 527 includes only the terms in  $\Omega$ ,  $2\Omega$ ,  $L$ ,  $2L$ , and  $3L$ . This value of the nutation has been used in all the ephemerides of the Sun, Moon, and planets, in the apparent places of the stars for every tenth transit given on pages 552 to 556, and in  $f'$  on pages 532 to 539. The nutation used in the daily ephemerides of the circumpolar stars, pages 540 to 551, is computed with—

$$\begin{array}{ll}
 A = \tau - 0.34217 \sin \Omega & B = -9.2100 \cos \Omega \\
 + 0.00415 \sin 2\Omega & + 0.0900 \cos 2\Omega \\
 - 0.02495 \sin 2L & - 0.5460 \cos 2L \\
 + 0.00218 \sin (L + 75.3^\circ) & - 0.0210 \cos (3L + 78.7^\circ) \\
 - 0.00097 \sin (3L + 78.7^\circ) & + 0.0090 \cos (L - 78.7^\circ) \\
 + 0.00025 \sin (2\odot - \Omega) & + 0.0067 \cos (2\odot - \Omega) \\
 - 0.00005 \sin 2(\odot - \Omega) & + 0.0024 \cos (2\Gamma' - \Omega) \\
 + 0.00010 \sin 2(\odot - \Gamma') & - 0.0023 \sin I'' \\
 + 0.00009 \sin (2\Gamma' - \Omega) & + 0.0008 \cos 2\Gamma'' \\
 + 0.00005 \cos \Gamma'' & - 0.0885 \cos 2\zeta \\
 + 0.00004 \sin 2\Gamma'' & \\
 - 0.00405 \sin 2\zeta & \\
 + 0.00135 \sin (\zeta - \Gamma'') & 
 \end{array}$$

and the result in right ascension is diminished by the quantity  $f - f' = -0''.1866 \sin 2\zeta + 0''.0622 \sin (\zeta - \Gamma'')$ , which is the same for all stars.

The terms of short period in the nutation given on pages 287 and 288 are included in the values of the star-numbers on pages 528 to 539. They are derived in accordance with the formulæ—

$$\begin{aligned}
 \delta''\psi &= \text{Nutation in longitude} = A''\psi \\
 \delta''\omega &= \text{Nutation in obliquity} = -B''
 \end{aligned}$$

where  $\psi$  = the luni-solar precession =  $50''.3712$ , and  $A''$  and  $B''$  are respectively the short period terms in the expressions for  $A$  and  $B$  on page 526. By short period terms are meant all terms involving the Moon's mean longitude.

According to the formulæ on pages 290 and 526, the star constants  $a, b, c, d, a', b', c', d'$ , are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

$$\begin{array}{ll}
 \text{To } a - a_0 & \text{To } \delta - \delta_0 \\
 + 0.000003 \tau^2 \sin a \} \tan \delta & + 0.000975 \tau^2 \sin^2 a \\
 - 0.000149 \tau^2 \cos a \} & - 0.000023 \cos 2\Omega \\
 - 0.0000650 \tau^2 \sin 2a \} & - 0.000080 \cos 2\Omega \cos 2a \\
 + 0.0000103 \sin 2\Omega \cos 2a \} \tan^2 \delta & - 0.000077 \sin 2\Omega \sin 2a \\
 - 0.0000107 \cos 2\Omega \sin 2a \} & + 0.000040 \cos 2\odot \\
 + 0.0000620 \sin 2\odot \cos 2a \} \sec^2 \delta & - 0.000467 \cos 2\odot \cos 2a \\
 - 0.0000622 \cos 2\odot \sin 2a \} & - 0.000465 \sin 2\odot \sin 2a
 \end{array}$$

To $\alpha - \alpha_0$	To $\delta - \delta_0$
$\left. \begin{aligned} &+ 0.000\ 0513 \sin (\odot + \Omega) \cos 2a \\ &- 0.000\ 0507 \cos (\odot + \Omega) \sin 2a \\ &+ 0.000\ 0097 \sin (\odot - \Omega) \cos 2a \\ &- 0.000\ 0053 \cos (\odot - \Omega) \sin 2a \end{aligned} \right\} \tan \delta \sec \delta$	$\left. \begin{aligned} &- 0.000\ 039 \cos (\odot + \Omega) \\ &- 0.000\ 380 \cos (\odot + \Omega) \cos 2a \\ &- 0.000\ 385 \sin (\odot + \Omega) \sin 2a \\ &- 0.000\ 380 \cos (\odot - \Omega) \\ &- 0.000\ 040 \cos (\odot - \Omega) \cos 2a \\ &- 0.000\ 072 \sin (\odot - \Omega) \sin 2a \end{aligned} \right\} \sin \delta \tan \delta$

These terms are negligible for stars whose declination is numerically less than  $80^\circ$ , but in computing the apparent places given in the American Ephemeris they have been applied whenever sensible.

The mean places of 383 stars, pages 304 to 311, are from the new *Catalogue of Fundamental Stars, for the epochs 1875 and 1900, Astronomical Papers of the American Ephemeris*, vol. VIII, part 2, prepared in this office, principally under the direction of Professor NEWCOMB.

The apparent places of Sirius and Procyon have been corrected for the effect of orbital motion, as determined from AUWERS' investigations, and tabulated in *Astronomical Papers of the American Ephemeris*, vol. I, pages 297-298. The values of these corrections are—

Year.	$\delta$ Sirius.	"	$\delta$ Procyon.	"
1907.0	$\Delta \alpha = - 0.101$	$\Delta \delta = + 0.62$	$\Delta \alpha = - 0.015$	$\Delta \delta = - 1.02$
1908.0	$\Delta \alpha = - 0.111$	$\Delta \delta = + 0.50$	$\Delta \alpha = - 0.027$	$\Delta \delta = - 0.97$

The ephemeris of the Sun is constructed from Professor NEWCOMB's *Tables of the Sun*, *Astronomical Papers of the American Ephemeris*, vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is  $8''.80$ , *Paris Conference, May, 1896.*

The adopted apparent semidiameter of the Sun at the Earth's mean distance is that found by Prof. WM. HARKNESS, from 35 842 meridian observations made at Greenwich, Paris, Washington, Königsberg, Milan, Madras, Dorpat, Modena, and Seeberg, viz.,  $16' 1''.50$ ; while in the computation of eclipses and the transit of Mercury, the value given by AUWERS in the *Astronomische Nachrichten*, 1891, Bd. 128, S. 367, is employed, viz.,  $15' 59''.63$ .

The Sun's rectangular equatorial co-ordinates are computed from the longitudes and latitudes by the following formulæ:—

$$\begin{aligned} X &= R \cos \lambda \\ Y &= R \sin \lambda \cos \omega - 19.3 R \beta \\ Z &= R \sin \lambda \sin \omega + 44.5 R \beta \end{aligned}$$

The reductions to mean equinox, 1907.0, are computed by the formulæ—

$$\begin{aligned} \Delta X &= + Y \sec \omega \Delta \lambda \sin 1'' \\ \Delta Y &= - X \cos \omega \Delta \lambda \sin 1'' + Z \Delta \omega \sin 1'' + 9.1 \tau R \sin (\lambda + 6^\circ) \\ \Delta Z &= - X \sin \omega \Delta \lambda \sin 1'' - Y \Delta \omega \sin 1'' - 21.0 \tau R \sin (\lambda + 6^\circ) \end{aligned}$$

where the numerical coefficients are in units of the seventh place of decimals and

$R$  = the Sun's radius vector;

$\lambda$  = the Sun's true longitude;

$\beta$  = the Sun's true latitude, expressed in seconds of arc;

$\omega$  = the obliquity of the ecliptic;

$\Delta \lambda$  = the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year;

$\Delta \omega$  = the reduction of the mean to the apparent obliquity;

$\tau$  = the fraction of the year since the beginning of the Besselian fictitious year.

The longitude, latitude and parallax of the Moon are derived from HANSEN'S *Tables de la Lune*, London, 1857, the mean longitude being corrected in accordance with Professor NEWCOMB'S *Researches on the Motion of the Moon*, Part I, page 268,\* and Table XXXIV being replaced by a corrected one.

The apparent semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax,  $\pi$ , by the formula,

$$S = 0.272\ 506\ \pi + 1''.50$$

where the constant 0.272 506 is based on data from occultations given by Mr. J. PETERS in the *Astronomische Nachrichten*, 1895, Bd. 138, S. 147; and the constant 1''.50 is added to cover the average effect of irradiation. The value of the Moon's semidiameter employed in the computation of eclipses for 1907 was computed from the formula,

$$S = 0.272\ 274\ \pi$$

the constant being the one used in this Ephemeris prior to 1902.

The ephemerides of Mercury, Venus and Mars are derived from Professor NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, vol. VI, parts 2, 3 and 4.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by Dr. GEORGE W. HILL, *Astronomical Papers of the American Ephemeris*, vol. VII, parts 1 and 2.

The ephemerides of Uranus and Neptune are derived from Professor NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, vol. VII, parts 3 and 4.

The semidiameters of the planets are computed from the following values:—

	Semidiameter.	Log Dist.	Authority.
Mercury	3.34	0.00	LE VERRIER, <i>Theory of Mercury</i> .
Venus	$8.546 \pm 0.086$	0.00	
Mars	$2.842 \pm 0.057$	0.25	PEIRCE, from the Washington Observations of 1845 and 1846, made with the Mural Circle.
Jupiter (polar)	$18.78 \pm 0.067$	0.70	
Saturn (polar)	$8.77 \pm 0.039$	0.95	
Uranus	$1.68 \pm 0.3$	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

The elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with BESSEL'S method, the special forms employed being a modification of those developed in CHAUVENET'S *Spherical and Practical Astronomy*.

The satellites of Mars are computed from manuscript tables based upon elements deduced by Prof. WALTER S. HARSHMAN. His elements of Deimos are published in the *Astronomical Journal*, 1894, vol. XIV, p. 147; but those of Phobos are yet in manuscript.

The eclipses of Jupiter's satellites are computed from a *Continuation of DAMOISEAU'S Tables*, prepared in this office. The occultations, transits, etc., are computed from WOOLHOUSE'S tables, published in the *British Nautical Almanac* for 1835; Table II of each satellite having been adapted to DAMOISEAU'S tables.

The fifth satellite of Jupiter is computed from manuscript tables based upon unpublished elements deduced by Mr. J. ROBERTSON.

The elongations and conjunctions of the satellites and the position of the rings of Saturn are computed from Prof. H. STRUVE'S elements as published in *Beobachtungen der Saturnstrabanten*, St. Petersburg, 1898.

\* *Astronomical Observations made at the U. S. Naval Observatory, Washington, 1875, Appendix II.*

The apparent dimensions of the rings of Saturn are computed from BESSEL's data, except those for the dusky ring, which are based on the observations of Messrs. O. STRUVE, A. HALL, E. E. BARNARD and T. LEWIS, at Pulkowa, Washington, Mt. Hamilton and Greenwich.

The elongations of the satellites of Uranus are computed from the data of Professor NEWCOMB's *Uranian and Neptunian Systems, Washington Observations*, 1873, Appendix I.

The elongations of the satellite of Neptune are computed from manuscript tables based upon Prof. A. HALL's elements published in the *Astronomical Journal*, 1898, vol. XIX, p. 65.

The following-named persons were engaged in the preparation of the American Ephemeris and Nautical Almanac for the year 1907:

*Assistants and Employés.*—H. B. HEDRICK, H. L. RICE, W. AUHAGEN, J. ROBERTSON, H. G. HODGKINS, J. H. ROOT, GEO. B. MERRIMAN, F. E. MILLIS, W. T. CARRIGAN, H. B. EVANS, H. B. ROSS, E. D. TILLYER, R. KEITH, R. BUCHANAN, E. B. DAVIS, A. DOOLITTLE, J. MCWILLIAM, and H. F. M. HEDRICK.

[Eph 07]

**CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S  
MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING  
TO A CORRECTED LUNAR DISTANCE.**

Approximate Interval.		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																											
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52		
h	m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	2	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3
0	20	2	40	0	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	6
0	30	2	30	0	1	1	2	2	2	2	3	3	4	4	5	5	6	6	6	7	7	7	8	8	8	9	9	9	9
0	40	2	20	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	10	11	11	11	11
0	50	2	10	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	9	9	10	10	11	12	12	13	13	13	13
1	0	2	0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	14	14	14
1	10	1	50	1	1	2	2	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	15	15	15	15
1	20	1	40	1	1	2	3	3	4	4	5	6	7	7	8	9	9	10	10	11	12	12	13	14	15	16	16	16	16
1	30	1	30	1	1	2	3	4	4	5	6	6	7	8	8	9	10	10	11	11	12	12	13	14	15	16	17	17	17
		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																											
		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100				
h	m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6	7
0	20	7	7	7	7	8	8	8	8	9	9	9	9	9	10	10	10	11	11	11	11	12	12	12	12	12	12	12	12
0	30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	15	15	15	16	16	16	17	17	17	17	17	17	17
0	40	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	21	21	22	22	22
0	50	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	24	25	25	25	25
1	0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28	28	28	28	28
1	10	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	29	29	30	30	30	30	30
1	20	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31	31	31	31	31
1	30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31	32	32	32	32
		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																											
		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138									
h	m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	8	8	8	9	9	9	9	9	9	9	9	9	9
0	20	13	13	13	13	14	14	14	14	15	15	15	15	15	15	16	16	16	16	16	16	17	17	17	17	17	17	17	17
0	30	18	18	18	19	19	19	20	20	20	21	21	21	21	22	22	22	23	23	23	24	24	24	24	24	24	24	24	24
0	40	22	22	23	23	24	24	25	25	25	26	26	27	27	27	28	28	28	29	29	29	30	30	30	30	30	30	30	30
0	50	26	26	26	27	27	28	29	29	29	30	30	31	31	31	32	32	33	33	33	34	34	34	34	34	34	34	34	34
1	0	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37	38	38	39	39	40	40	40	40	40	40	40
1	10	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	39	40	40	41	41	41	42	42	42	42	42	42
1	20	31	32	33	33	34	34	35	35	36	37	37	38	38	39	39	40	40	41	41	42	42	43	43	43	43	43	43	43
1	30	32	32	33	34	34	35	35	36	36	37	38	38	39	39	40	40	41	41	42	42	43	43	44	44	44	44	44	44

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.										
Side- real.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0	0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10	0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22	0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161
Side- real.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.										
Side- real.	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	12 <sup>h</sup>	13 <sup>h</sup>	14 <sup>h</sup>	15 <sup>h</sup>	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	18.636	18.636	18.296	18.125	17.955	17.784	17.614	17.443	0	0.000
1	18.800	18.630	18.459	18.289	18.119	17.948	17.778	17.607	1	0.003
2	18.964	18.794	18.623	18.453	18.282	18.112	17.941	17.771	2	0.005
3	19.128	18.958	18.787	18.617	18.446	18.276	18.105	17.935	3	0.008
4	19.292	19.121	18.951	18.780	18.610	18.440	18.269	18.099	4	0.011
5	19.456	19.285	19.115	18.944	18.774	18.603	18.433	18.263	5	0.014
6	19.619	19.449	19.279	19.108	18.938	18.767	18.597	18.426	6	0.016
7	19.783	19.613	19.442	19.272	19.101	18.931	18.761	18.590	7	0.019
8	19.947	19.777	19.606	19.436	19.265	19.095	18.924	18.754	8	0.022
9	20.111	19.940	19.770	19.600	19.429	19.259	19.088	18.918	9	0.025
10	20.275	20.104	19.934	19.763	19.593	19.423	19.252	19.082	10	0.027
11	20.439	20.268	20.098	19.927	19.757	19.586	19.416	19.245	11	0.030
12	20.602	20.432	20.261	20.091	19.921	19.750	19.580	19.409	12	0.033
13	20.766	20.596	20.425	20.255	20.084	19.914	19.744	19.573	13	0.035
14	20.930	20.760	20.589	20.419	20.248	20.078	19.907	19.737	14	0.038
15	21.094	20.923	20.753	20.583	20.412	20.242	20.071	19.901	15	0.041
16	21.258	21.087	20.917	20.746	20.576	20.405	20.235	20.065	16	0.044
17	21.422	21.251	21.081	20.910	20.740	20.569	20.399	20.228	17	0.046
18	21.585	21.415	21.244	21.074	20.904	20.733	20.563	20.392	18	0.049
19	21.749	21.579	21.408	21.238	21.067	20.897	20.727	20.556	19	0.052
20	21.913	21.743	21.572	21.402	21.231	21.061	20.890	20.720	20	0.055
21	22.077	21.906	21.736	21.565	21.395	21.225	21.054	20.884	21	0.057
22	22.241	22.070	21.900	21.729	21.559	21.388	21.218	21.048	22	0.060
23	22.404	22.234	22.064	21.893	21.723	21.552	21.382	21.211	23	0.063
24	22.568	22.398	22.227	22.057	21.887	21.716	21.546	21.375	24	0.066
25	22.732	22.562	22.391	22.221	22.050	21.880	21.709	21.539	25	0.068
26	22.896	22.726	22.555	22.385	22.214	22.044	21.873	21.703	26	0.071
27	23.060	22.889	22.719	22.548	22.378	22.208	22.037	21.867	27	0.074
28	23.224	23.053	22.883	22.712	22.542	22.371	22.201	22.031	28	0.076
29	23.387	23.217	23.047	22.876	22.706	22.535	22.365	22.194	29	0.079
30	23.551	23.381	23.210	23.040	22.869	22.699	22.529	22.358	30	0.082
31	23.715	23.545	23.374	23.204	23.033	22.863	22.692	22.522	31	0.085
32	23.879	23.708	23.538	23.368	23.197	23.027	22.856	22.686	32	0.087
33	24.043	23.872	23.702	23.531	23.361	23.191	23.020	22.850	33	0.090
34	24.207	24.036	23.866	23.695	23.525	23.354	23.184	23.013	34	0.093
35	24.370	24.200	24.029	23.859	23.689	23.518	23.348	23.177	35	0.096
36	24.534	24.364	24.193	24.023	23.852	23.682	23.512	23.341	36	0.098
37	24.698	24.528	24.357	24.187	24.016	23.846	23.675	23.505	37	0.101
38	24.862	24.691	24.521	24.351	24.180	24.010	23.839	23.669	38	0.104
39	25.026	24.855	24.685	24.514	24.344	24.173	24.003	23.833	39	0.106
40	25.190	25.019	24.849	24.678	24.508	24.337	24.167	23.996	40	0.109
41	25.353	25.183	25.012	24.842	24.672	24.501	24.331	24.160	41	0.112
42	25.517	25.347	25.176	25.006	24.835	24.665	24.495	24.324	42	0.115
43	25.681	25.511	25.340	25.170	24.999	24.829	24.658	24.488	43	0.117
44	25.845	25.674	25.504	25.333	25.163	24.993	24.822	24.652	44	0.120
45	26.009	25.838	25.668	25.497	25.327	25.156	24.986	24.816	45	0.123
46	26.172	26.002	25.832	25.661	25.491	25.320	25.150	24.979	46	0.126
47	26.336	26.166	25.995	25.825	25.655	25.484	25.314	25.143	47	0.128
48	26.500	26.330	26.159	25.989	25.818	25.648	25.477	25.307	48	0.131
49	26.664	26.493	26.323	26.153	25.982	25.812	25.641	25.471	49	0.134
50	26.828	26.657	26.487	26.316	26.146	25.976	25.805	25.635	50	0.137
51	26.992	26.821	26.651	26.480	26.310	26.139	25.969	25.798	51	0.139
52	27.155	26.985	26.815	26.644	26.474	26.303	26.133	25.962	52	0.142
53	27.319	27.149	26.978	26.808	26.637	26.467	26.297	26.126	53	0.145
54	27.483	27.313	27.142	26.972	26.801	26.631	26.460	26.290	54	0.147
55	27.647	27.476	27.306	27.136	26.965	26.795	26.624	26.454	55	0.150
56	27.811	27.640	27.470	27.299	27.129	26.959	26.788	26.618	56	0.153
57	27.975	27.804	27.634	27.463	27.293	27.122	26.952	26.781	57	0.156
58	28.138	27.968	27.797	27.627	27.457	27.286	27.116	26.945	58	0.158
59	28.302	28.132	27.961	27.791	27.620	27.450	27.280	27.109	59	0.161
Side- real.	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	12 <sup>h</sup>	13 <sup>h</sup>	14 <sup>h</sup>	15 <sup>h</sup>	For Seconds.	



TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.									
Sidereal.	16 <sup>h</sup>	17 <sup>h</sup>	18 <sup>h</sup>	19 <sup>h</sup>	20 <sup>h</sup>	21 <sup>h</sup>	22 <sup>h</sup>	23 <sup>h</sup>	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0 0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1 0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2 0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3 0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4 0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5 0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6 0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7 0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8 0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9 0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10 0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11 0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12 0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13 0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14 0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15 0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16 0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17 0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18 0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19 0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20 0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21 0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22 0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23 0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24 0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25 0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26 0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27 0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28 0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29 0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30 0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31 0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32 0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33 0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34 0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35 0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36 0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37 0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38 0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39 0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40 0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41 0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42 0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43 0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44 0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45 0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46 0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47 0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48 0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49 0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50 0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51 0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52 0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53 0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54 0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55 0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56 0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57 0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58 0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59 0.161
Sidereal.	16 <sup>h</sup>	17 <sup>h</sup>	18 <sup>h</sup>	19 <sup>h</sup>	20 <sup>h</sup>	21 <sup>h</sup>	22 <sup>h</sup>	23 <sup>h</sup>	For Seconds.

TO BE ADDED TO A MEAN TIME INTERVAL.									
Mean Solar.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0 0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1 0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2 0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3 0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4 0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5 0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6 0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7 0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8 0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9 0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10 0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11 0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12 0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13 0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14 0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15 0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16 0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17 0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18 0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19 0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20 0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21 0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22 0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23 0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24 0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25 0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26 0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27 0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28 0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29 0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30 0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31 0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32 0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33 0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34 0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35 0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36 0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37 0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38 0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39 0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40 0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41 0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42 0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43 0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44 0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45 0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46 0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47 0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48 0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49 0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50 0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51 0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52 0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53 0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54 0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55 0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56 0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57 0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58 0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59 0.162
Mean Solar.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	For Seconds.

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

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TO BE ADDED TO A MEAN TIME INTERVAL.									
Mean Solar.	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	12 <sup>h</sup>	13 <sup>h</sup>	14 <sup>h</sup>	15 <sup>h</sup>	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	18.852	28.708	38.565	48.421	58.278	8.134	17.991	27.847	0.000
1	19.016	28.873	38.729	48.585	58.442	8.298	18.155	28.011	0.003
2	19.180	29.037	38.893	48.750	58.606	8.463	18.319	28.176	0.005
3	19.345	29.201	39.058	48.914	58.771	8.627	18.483	28.340	0.008
4	19.509	29.365	39.222	49.078	58.935	8.791	18.648	28.504	0.011
5	19.673	29.530	39.386	49.243	59.099	8.956	18.812	28.668	0.014
6	19.837	29.694	39.550	49.407	59.263	9.120	18.976	28.833	0.016
7	20.002	29.858	39.715	49.571	59.428	9.284	19.141	28.997	0.019
8	20.166	30.022	39.879	49.735	59.592	9.448	19.305	29.161	0.022
9	20.330	30.187	40.043	49.900	59.756	9.613	19.469	29.326	0.025
10	20.495	30.351	40.207	50.064	59.920	9.777	19.633	29.490	0.027
11	20.659	30.515	40.372	50.228	60.085	9.941	19.798	29.654	0.030
12	20.823	30.680	40.536	50.393	60.249	10.105	19.962	29.818	0.033
13	20.987	30.844	40.700	50.557	60.413	10.270	20.126	29.983	0.036
14	21.152	31.008	40.865	50.721	60.578	10.434	20.290	30.147	0.038
15	21.316	31.172	41.029	50.885	60.742	10.598	20.455	30.311	0.041
16	21.480	31.337	41.193	51.050	60.906	10.763	20.619	30.476	0.044
17	21.644	31.501	41.357	51.214	61.070	10.927	20.783	30.640	0.047
18	21.809	31.665	41.522	51.378	61.235	11.091	20.948	30.804	0.049
19	21.973	31.829	41.686	51.542	61.399	11.255	21.112	30.968	0.052
20	22.137	31.994	41.850	51.707	61.563	11.420	21.276	31.133	0.055
21	22.302	32.158	42.015	51.871	61.727	11.584	21.440	31.297	0.057
22	22.466	32.322	42.179	52.035	61.892	11.748	21.605	31.461	0.060
23	22.630	32.487	42.343	52.200	62.056	11.912	21.769	31.625	0.063
24	22.794	32.651	42.507	52.364	62.220	12.077	21.933	31.790	0.066
25	22.959	32.815	42.672	52.528	62.385	12.241	22.098	31.954	0.068
26	23.123	32.979	42.836	52.692	62.549	12.405	22.262	32.118	0.071
27	23.287	33.144	43.000	52.857	62.713	12.570	22.426	32.283	0.074
28	23.451	33.308	43.164	53.021	62.877	12.734	22.590	32.447	0.077
29	23.616	33.472	43.329	53.185	63.042	12.898	22.755	32.611	0.079
30	23.780	33.637	43.493	53.349	63.206	13.062	22.919	32.775	0.082
31	23.944	33.801	43.657	53.514	63.370	13.227	23.083	32.940	0.085
32	24.109	33.965	43.822	53.678	63.534	13.391	23.247	33.104	0.088
33	24.273	34.129	43.986	53.842	63.699	13.555	23.412	33.268	0.090
34	24.437	34.294	44.150	54.007	63.863	13.720	23.576	33.432	0.093
35	24.601	34.458	44.314	54.171	64.027	13.884	23.740	33.597	0.096
36	24.766	34.622	44.479	54.335	64.192	14.048	23.905	33.761	0.099
37	24.930	34.786	44.643	54.499	64.356	14.212	24.069	33.925	0.101
38	25.094	34.951	44.807	54.664	64.520	14.377	24.233	34.090	0.104
39	25.259	35.115	44.971	54.828	64.684	14.541	24.397	34.254	0.107
40	25.423	35.279	45.136	54.992	64.849	14.705	24.562	34.418	0.110
41	25.587	35.444	45.300	55.156	65.013	14.869	24.726	34.582	0.112
42	25.751	35.608	45.464	55.321	65.177	15.034	24.890	34.747	0.115
43	25.916	35.772	45.629	55.485	65.342	15.198	25.054	34.911	0.118
44	26.080	35.936	45.793	55.649	65.506	15.362	25.219	35.075	0.120
45	26.244	36.101	45.957	55.814	65.670	15.527	25.383	35.239	0.123
46	26.408	36.265	46.121	55.978	65.834	15.691	25.547	35.404	0.126
47	26.573	36.429	46.286	56.142	65.999	15.855	25.712	35.568	0.129
48	26.737	36.593	46.450	56.306	66.163	16.019	25.876	35.732	0.131
49	26.901	36.758	46.614	56.471	66.327	16.184	26.040	35.897	0.134
50	27.066	36.922	46.778	56.635	66.491	16.348	26.204	36.061	0.137
51	27.230	37.086	46.943	56.799	66.656	16.512	26.369	36.225	0.140
52	27.394	37.251	47.107	56.964	66.820	16.676	26.533	36.389	0.142
53	27.558	37.415	47.271	57.128	66.984	16.841	26.697	36.554	0.145
54	27.723	37.579	47.436	57.292	67.149	17.005	26.861	36.718	0.148
55	27.887	37.743	47.600	57.456	67.313	17.169	27.026	36.882	0.151
56	28.051	37.908	47.764	57.621	67.477	17.334	27.190	37.047	0.153
57	28.215	38.072	47.928	57.785	67.641	17.498	27.354	37.211	0.156
58	28.380	38.236	48.093	57.949	67.806	17.662	27.519	37.375	0.159
59	28.544	38.400	48.257	58.113	67.970	17.826	27.683	37.539	0.162
Mean Solar.	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	12 <sup>h</sup>	13 <sup>h</sup>	14 <sup>h</sup>	15 <sup>h</sup>	For Seconds.

TO BE ADDED TO A MEAN TIME INTERVAL.										
Mean Solar.	16 <sup>h</sup>	17 <sup>h</sup>	18 <sup>h</sup>	19 <sup>h</sup>	20 <sup>h</sup>	21 <sup>h</sup>	22 <sup>h</sup>	23 <sup>h</sup>	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162
Mean Solar.	16 <sup>h</sup>	17 <sup>h</sup>	18 <sup>h</sup>	19 <sup>h</sup>	20 <sup>h</sup>	21 <sup>h</sup>	22 <sup>h</sup>	23 <sup>h</sup>	For Seconds.	

TABLE FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

If the sidereal time is  $\left\{ \begin{array}{l} \text{less than } 1^{\text{h}} 25^{\text{m}}.8, \text{ subtract it from } 1^{\text{h}} 25^{\text{m}}.8; \\ \text{between } 1^{\text{h}} 25^{\text{m}}.8 \text{ and } 13^{\text{h}}, \text{ subtract } 1^{\text{h}} 25^{\text{m}}.8 \text{ from it;} \\ \text{greater than } 13^{\text{h}} 25^{\text{m}}.8, \text{ subtract it from } 25^{\text{h}} 25^{\text{m}}.8; \end{array} \right.$

and the remainder is the hour angle of Polaris.

With this hour angle take out the correction from Table IV (below), and add it to or subtract it from the true altitude, according to its sign. The result is the approximate latitude of the place.

*Example.*—1907, November 3, at  $10^{\text{h}} 40^{\text{m}} 30^{\text{s}}$ , P. M., mean solar time, in longitude  $29^{\circ}$  east of Greenwich, suppose the true altitude of Polaris to be  $43^{\circ} 20'$ : required the latitude of the place.

Local astronomical mean time	h	m	s
Reduction from Table III, for $10^{\text{h}} 40^{\text{m}} 30^{\text{s}}$	10	40	30
Greenwich sidereal time of mean noon, November 3, page 183	+	1	45
Reduction from Table III, for longitude ( $= 1^{\text{h}} 56^{\text{m}}$ east, or minus)	14	46	23
Sum (having regard to signs) is equal to local sidereal time	—	0	19
	1	28	19
Subtract sidereal time	h	m	s
Remainder is equal to hour angle of Polaris	1	25	48
	1	28	19
	0	2	31
True altitude	+	43	20
Correction from Table IV (below)	—	1	11
Approximate latitude	+	42	9

TABLE IV.—1907.

Hour angle.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>
m						
0	— 0 11.4 0.0	— 1 8.9 0.4	— 1 1.6 0.8	— 0 50.1 1.1	— 0 35.1 1.3	— 0 17.8 1.5
5	1 11.4 0.1	1 8.5 0.5	1 0.8 0.8	0 49.0 1.2	0 33.8 1.4	0 16.3 1.5
10	1 11.3 0.1	1 8.0 0.5	1 0.0 0.9	0 47.8 1.2	0 32.4 1.4	0 14.8 1.5
15	1 11.2 0.1	1 7.5 0.5	0 59.1 0.9	0 46.6 1.2	0 31.0 1.4	0 13.2 1.5
20	— 1 11.1 0.2	— 1 7.0 0.6	— 0 58.2 0.9	— 0 45.4 1.2	— 0 29.6 1.5	— 0 11.7 1.6
25	1 10.9 0.2	1 6.4 0.6	0 57.3 0.9	0 44.2 1.2	0 28.1 1.5	0 10.1 1.5
30	1 10.7 0.2	1 5.8 0.6	0 56.4 1.0	0 43.0 1.3	0 26.7 1.5	0 8.6 1.6
35	1 10.5 0.2	1 5.2 0.6	0 55.4 1.0	0 41.7 1.3	0 25.2 1.4	0 7.0 1.5
40	— 1 10.3 0.3	— 1 4.6 0.7	— 0 54.4 1.0	— 0 40.4 1.3	— 0 23.8 1.5	— 0 5.5 1.6
45	1 10.0 0.3	1 3.9 0.7	0 53.4 1.1	0 39.1 1.3	0 22.3 1.5	0 3.9 1.5
50	1 9.7 0.4	1 3.2 0.8	0 52.3 1.1	0 37.8 1.3	0 20.8 1.5	0 2.4 1.6
55	1 9.3 0.4	1 2.4 0.8	0 51.2 1.1	0 36.5 1.4	0 19.3 1.5	— 0 0.8 1.5
60	— 1 8.9 0.4	— 1 1.6 0.8	— 0 50.1 1.1	— 0 35.1 1.4	— 0 17.8 1.5	+ 0 0.7 1.5
Hour angle.	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>
m						
0	+ 0 0.7 1.6	+ 0 19.2 1.4	+ 0 36.2 1.4	+ 0 50.8 1.1	+ 1 2.0 0.7	+ 1 9.0 0.4
5	0 2.3 1.5	0 20.6 1.5	0 37.6 1.4	0 51.9 1.1	1 2.7 0.8	1 9.4 0.3
10	0 3.8 1.5	0 22.1 1.5	0 38.9 1.3	0 53.0 1.0	1 3.5 0.7	1 9.7 0.3
15	0 5.4 1.5	0 23.6 1.5	0 40.2 1.3	0 54.0 1.0	1 4.2 0.6	1 10.0 0.3
20	+ 0 6.9 1.6	+ 0 25.1 1.4	+ 0 41.5 1.2	+ 0 55.0 1.0	+ 1 4.8 0.6	+ 1 10.3 0.3
25	0 8.5 1.5	0 26.5 1.4	0 42.7 1.2	0 56.0 0.9	1 5.4 0.6	1 10.6 0.2
30	0 10.0 1.5	0 27.9 1.4	0 43.9 1.2	0 56.9 0.9	1 6.0 0.6	1 10.8 0.2
35	0 11.6 1.5	0 29.4 1.4	0 45.1 1.2	0 57.8 0.9	1 6.6 0.6	1 11.0 0.1
40	+ 0 13.1 1.6	+ 0 30.8 1.4	+ 0 46.3 1.2	+ 0 58.7 0.9	+ 1 7.2 0.5	+ 1 11.1 0.1
45	0 14.7 1.5	0 32.2 1.3	0 47.5 1.1	0 59.6 0.8	1 7.7 0.5	1 11.2 0.1
50	0 16.2 1.5	0 33.5 1.4	0 48.6 1.1	1 0.4 0.8	1 8.1 0.5	1 11.3 0.1
55	0 17.7 1.5	0 34.9 1.3	0 49.7 1.1	1 1.2 0.8	1 8.6 0.5	1 11.4 0.0
60	+ 0 19.2 1.5	+ 0 36.2 1.3	+ 0 50.8 1.1	+ 1 2.0 0.8	+ 1 9.0 0.4	+ 1 11.4 0.0

LOGARITHMS OF SINES AND COSINES. <i>With the argument in time.</i>											
0 <sup>h</sup> , sine +; 12 <sup>h</sup> , sine —; 6 <sup>h</sup> , cosine —; 18 <sup>h</sup> , cosine +; <i>With minutes in left hand column.</i>											
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1 <sup>m</sup> .0
0		6.6398	6.9408	7.1169	7.2419	7.3383	7.4180	7.4849	7.5429	7.5941	7.6398
1	7.6398	7.6812	7.7190	7.7538	7.7859	7.8159	7.8439	7.8703	7.8951	7.9186	7.9408
2	7.9408	7.9620	7.9822	8.0015	8.0200	8.0377	8.0548	8.0712	8.0870	8.1022	8.1169
3	8.1169	8.1312	8.1450	8.1583	8.1713	8.1839	8.1961	8.2080	8.2196	8.2309	8.2419
4	8.2419	8.2526	8.2630	8.2733	8.2832	8.2930	8.3025	8.3119	8.3210	8.3300	8.3388
5	8.3388	8.3474	8.3558	8.3641	8.3722	8.3801	8.3880	8.3956	8.4032	8.4106	8.4179
6	8.4179	8.4251	8.4322	8.4391	8.4459	8.4527	8.4593	8.4658	8.4723	8.4786	8.4848
7	8.4848	8.4910	8.4971	8.5031	8.5090	8.5148	8.5206	8.5262	8.5318	8.5374	8.5428
8	8.5428	8.5482	8.5535	8.5588	8.5640	8.5691	8.5742	8.5792	8.5842	8.5891	8.5939
9	8.5939	8.5987	8.6035	8.6082	8.6128	8.6174	8.6220	8.6265	8.6309	8.6353	8.6397
10	8.6397	8.6440	8.6483	8.6525	8.6567	8.6609	8.6650	8.6690	8.6731	8.6771	8.6810
11	8.6810	8.6850	8.6889	8.6927	8.6965	8.7003	8.7041	8.7078	8.7115	8.7152	8.7188
12	8.7188	8.7224	8.7260	8.7295	8.7330	8.7365	8.7400	8.7434	8.7468	8.7502	8.7535
13	8.7535	8.7569	8.7602	8.7634	8.7667	8.7699	8.7731	8.7763	8.7794	8.7826	8.7857
14	8.7857	8.7888	8.7918	8.7949	8.7979	8.8009	8.8039	8.8068	8.8098	8.8127	8.8156
15	8.8156	8.8185	8.8213	8.8242	8.8270	8.8298	8.8326	8.8354	8.8381	8.8409	8.8436
16	8.8436	8.8463	8.8490	8.8516	8.8543	8.8569	8.8595	8.8621	8.8647	8.8673	8.8699
17	8.8699	8.8724	8.8749	8.8775	8.8799	8.8824	8.8849	8.8874	8.8898	8.8922	8.8946
18	8.8946	8.8970	8.8994	8.9018	8.9042	8.9065	8.9089	8.9112	8.9135	8.9158	8.9181
19	8.9181	8.9203	8.9226	8.9249	8.9271	8.9293	8.9315	8.9337	8.9359	8.9381	8.9403
20	8.9403	8.9425	8.9446	8.9467	8.9489	8.9510	8.9531	8.9552	8.9573	8.9594	8.9614
21	8.9614	8.9635	8.9655	8.9676	8.9696	8.9716	8.9736	8.9756	8.9776	8.9796	8.9816
22	8.9816	8.9835	8.9855	8.9874	8.9894	8.9913	8.9932	8.9951	8.9970	8.9989	9.0008
23	9.0008	9.0027	9.0046	9.0064	9.0083	9.0101	9.0120	9.0138	9.0156	9.0174	9.0192
24	9.0192	9.0210	9.0228	9.0246	9.0264	9.0282	9.0299	9.0317	9.0334	9.0352	9.0369
25	9.0369	9.0386	9.0403	9.0421	9.0438	9.0455	9.0472	9.0488	9.0505	9.0522	9.0539
26	9.0539	9.0555	9.0572	9.0588	9.0605	9.0621	9.0637	9.0653	9.0670	9.0686	9.0702
27	9.0702	9.0718	9.0734	9.0750	9.0765	9.0781	9.0797	9.0812	9.0828	9.0843	9.0859
28	9.0859	9.0874	9.0890	9.0905	9.0920	9.0935	9.0951	9.0966	9.0981	9.0996	9.1011
29	9.1011	9.1025	9.1040	9.1055	9.1070	9.1084	9.1099	9.1114	9.1128	9.1143	9.1157
30	9.1157	9.1171	9.1186	9.1200	9.1214	9.1228	9.1242	9.1257	9.1271	9.1285	9.1299
31	9.1299	9.1312	9.1326	9.1340	9.1354	9.1368	9.1381	9.1395	9.1409	9.1422	9.1436
32	9.1436	9.1449	9.1462	9.1476	9.1489	9.1502	9.1516	9.1529	9.1542	9.1555	9.1568
33	9.1568	9.1581	9.1594	9.1607	9.1620	9.1633	9.1646	9.1659	9.1672	9.1684	9.1697
34	9.1697	9.1710	9.1722	9.1735	9.1747	9.1760	9.1772	9.1785	9.1797	9.1810	9.1822
35	9.1822	9.1834	9.1847	9.1859	9.1871	9.1883	9.1895	9.1907	9.1919	9.1931	9.1943
36	9.1943	9.1955	9.1967	9.1979	9.1991	9.2003	9.2015	9.2026	9.2038	9.2050	9.2061
37	9.2061	9.2073	9.2085	9.2096	9.2108	9.2119	9.2131	9.2142	9.2153	9.2165	9.2176
38	9.2176	9.2187	9.2199	9.2210	9.2221	9.2232	9.2243	9.2255	9.2266	9.2277	9.2288
39	9.2288	9.2299	9.2310	9.2321	9.2332	9.2343	9.2353	9.2364	9.2375	9.2386	9.2397
40	9.2397	9.2407	9.2418	9.2429	9.2439	9.2450	9.2461	9.2471	9.2482	9.2492	9.2503
41	9.2503	9.2513	9.2524	9.2534	9.2545	9.2555	9.2565	9.2576	9.2586	9.2596	9.2606
42	9.2606	9.2617	9.2627	9.2637	9.2647	9.2657	9.2667	9.2677	9.2687	9.2697	9.2707
43	9.2707	9.2717	9.2727	9.2737	9.2747	9.2757	9.2767	9.2777	9.2786	9.2796	9.2806
44	9.2806	9.2816	9.2825	9.2835	9.2845	9.2854	9.2864	9.2874	9.2883	9.2893	9.2902
45	9.2902	9.2912	9.2921	9.2931	9.2940	9.2950	9.2959	9.2969	9.2978	9.2987	9.2997
46	9.2997	9.3006	9.3015	9.3024	9.3034	9.3043	9.3052	9.3061	9.3070	9.3080	9.3089
47	9.3089	9.3098	9.3107	9.3116	9.3125	9.3134	9.3143	9.3152	9.3161	9.3170	9.3179
48	9.3179	9.3188	9.3197	9.3205	9.3214	9.3223	9.3232	9.3241	9.3250	9.3258	9.3267
49	9.3267	9.3276	9.3284	9.3293	9.3302	9.3310	9.3319	9.3328	9.3336	9.3345	9.3353
50	9.3353	9.3362	9.3370	9.3379	9.3387	9.3396	9.3404	9.3413	9.3421	9.3430	9.3438
51	9.3438	9.3446	9.3455	9.3463	9.3471	9.3480	9.3488	9.3496	9.3504	9.3513	9.3521
52	9.3521	9.3529	9.3537	9.3545	9.3554	9.3562	9.3570	9.3578	9.3586	9.3594	9.3602
53	9.3602	9.3610	9.3618	9.3626	9.3634	9.3642	9.3650	9.3658	9.3666	9.3674	9.3682
54	9.3682	9.3690	9.3698	9.3705	9.3713	9.3721	9.3729	9.3737	9.3745	9.3752	9.3760
55	9.3760	9.3768	9.3775	9.3783	9.3791	9.3799	9.3806	9.3814	9.3822	9.3829	9.3837
56	9.3837	9.3844	9.3852	9.3859	9.3867	9.3875	9.3882	9.3890	9.3897	9.3905	9.3912
57	9.3912	9.3920	9.3927	9.3934	9.3942	9.3949	9.3957	9.3964	9.3971	9.3979	9.3986
58	9.3986	9.3993	9.4001	9.4008	9.4015	9.4022	9.4030	9.4037	9.4044	9.4051	9.4059
59	9.4059	9.4066	9.4073	9.4080	9.4087	9.4094	9.4102	9.4109	9.4116	9.4123	9.4130
	1 <sup>m</sup> .0	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0
<i>With minutes in right hand column. 11<sup>h</sup>, sine +; 23<sup>h</sup>, sine —; 5<sup>h</sup>, cosine +; 17<sup>h</sup>, cosine —</i>											

TABLE V.

LOGARITHMS OF SINES AND COSINES. <i>With the argument in time.</i>											
$0^h$ , cosine +; $12^h$ , cosine -; $6^h$ , sine +; $18^h$ , sine - { <i>With minutes in left hand column.</i>											
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1 <sup>m</sup> .0
0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
2	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
3	0.0000	0.0000	0.0000	0.0000	0.0000	9.9999	9.9999	9.9999	9.9999	9.9999	9.9999
4	9.9999	9.9999	9.9999	9.9999	9.9999	.9999	.9999	.9999	.9999	.9999	.9999
5	9.9999	9.9999	9.9999	9.9999	9.9999	9.9999	9.9999	9.9999	9.9999	9.9999	9.9999
6	.9999	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998
7	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9997	.9997	.9997
8	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997
9	.9997	.9997	.9996	.9996	.9996	.9996	.9996	.9996	.9996	.9996	.9996
10	9.9996	9.9996	9.9996	9.9996	9.9996	9.9995	9.9995	9.9995	9.9995	9.9995	9.9995
11	.9995	.9995	.9995	.9995	.9995	.9995	.9994	.9994	.9994	.9994	.9994
12	.9994	.9994	.9994	.9994	.9994	.9994	.9993	.9993	.9993	.9993	.9993
13	.9993	.9993	.9993	.9993	.9993	.9992	.9992	.9992	.9992	.9992	.9992
14	.9992	.9992	.9992	.9992	.9992	.9991	.9991	.9991	.9991	.9991	.9991
15	9.9991	9.9991	9.9990	9.9990	9.9990	9.9990	9.9990	9.9990	9.9990	9.9990	9.9989
16	.9989	.9989	.9989	.9989	.9989	.9989	.9989	.9988	.9988	.9988	.9988
17	.9988	.9988	.9988	.9988	.9987	.9987	.9987	.9987	.9987	.9987	.9987
18	.9987	.9986	.9986	.9986	.9986	.9986	.9986	.9986	.9985	.9985	.9985
19	.9985	.9985	.9985	.9985	.9984	.9984	.9984	.9984	.9984	.9984	.9983
20	9.9983	9.9983	9.9983	9.9983	9.9983	9.9983	9.9982	9.9982	9.9982	9.9982	9.9982
21	.9982	.9982	.9981	.9981	.9981	.9981	.9981	.9981	.9980	.9980	.9980
22	.9980	.9980	.9980	.9979	.9979	.9979	.9979	.9979	.9978	.9978	.9978
23	.9978	.9978	.9978	.9978	.9977	.9977	.9977	.9977	.9977	.9976	.9976
24	.9976	.9976	.9976	.9976	.9975	.9975	.9975	.9975	.9975	.9974	.9974
25	9.9974	9.9974	9.9974	9.9973	9.9973	9.9973	9.9973	9.9973	9.9972	9.9972	9.9972
26	.9972	.9972	.9972	.9971	.9971	.9971	.9971	.9970	.9970	.9970	.9970
27	.9970	.9970	.9969	.9969	.9969	.9969	.9968	.9968	.9968	.9968	.9968
28	.9968	.9967	.9967	.9967	.9967	.9966	.9966	.9966	.9966	.9965	.9965
29	.9965	.9965	.9965	.9964	.9964	.9964	.9964	.9963	.9963	.9963	.9963
30	9.9963	9.9962	9.9962	9.9962	9.9962	9.9961	9.9961	9.9961	9.9961	9.9960	9.9960
31	.9960	.9960	.9960	.9959	.9959	.9959	.9959	.9958	.9958	.9958	.9958
32	.9958	.9957	.9957	.9957	.9956	.9956	.9956	.9956	.9955	.9955	.9955
33	.9955	.9955	.9954	.9954	.9954	.9953	.9953	.9953	.9953	.9952	.9952
34	.9952	.9952	.9951	.9951	.9951	.9951	.9950	.9950	.9950	.9949	.9949
35	9.9949	9.9949	9.9949	9.9948	9.9948	9.9948	9.9947	9.9947	9.9947	9.9946	9.9946
36	.9946	.9946	.9946	.9945	.9945	.9945	.9944	.9944	.9944	.9943	.9943
37	.9943	.9943	.9943	.9942	.9942	.9942	.9941	.9941	.9941	.9940	.9940
38	.9940	.9940	.9939	.9939	.9939	.9938	.9938	.9938	.9937	.9937	.9937
39	.9937	.9936	.9936	.9936	.9936	.9935	.9935	.9935	.9934	.9934	.9934
40	9.9934	9.9933	9.9933	9.9933	9.9932	9.9932	9.9931	9.9931	9.9931	9.9930	9.9930
41	.9930	.9930	.9929	.9929	.9929	.9928	.9928	.9928	.9927	.9927	.9927
42	.9927	.9926	.9926	.9926	.9925	.9925	.9925	.9924	.9924	.9923	.9923
43	.9923	.9923	.9922	.9922	.9922	.9921	.9921	.9921	.9920	.9920	.9919
44	.9919	.9919	.9919	.9918	.9918	.9918	.9917	.9917	.9916	.9916	.9916
45	9.9916	9.9915	9.9915	9.9915	9.9914	9.9914	9.9913	9.9913	9.9913	9.9912	9.9912
46	.9912	.9912	.9911	.9911	.9910	.9910	.9910	.9909	.9909	.9908	.9908
47	.9908	.9908	.9907	.9907	.9906	.9906	.9906	.9905	.9905	.9904	.9904
48	.9904	.9904	.9903	.9903	.9902	.9902	.9902	.9901	.9901	.9900	.9900
49	.9900	.9900	.9899	.9899	.9898	.9898	.9897	.9897	.9897	.9896	.9896
50	9.9896	9.9895	9.9895	9.9895	9.9894	9.9894	9.9893	9.9893	9.9892	9.9892	9.9892
51	.9892	.9891	.9891	.9890	.9890	.9890	.9889	.9889	.9888	.9888	.9887
52	.9887	.9887	.9886	.9886	.9885	.9885	.9885	.9884	.9884	.9883	.9883
53	.9883	.9882	.9882	.9881	.9881	.9881	.9880	.9880	.9879	.9879	.9878
54	.9878	.9878	.9877	.9877	.9876	.9876	.9876	.9875	.9875	.9874	.9874
55	9.9874	9.9873	9.9873	9.9872	9.9872	9.9871	9.9871	9.9870	9.9870	9.9870	9.9869
56	.9869	.9869	.9868	.9868	.9867	.9867	.9866	.9866	.9865	.9865	.9864
57	.9864	.9864	.9863	.9863	.9862	.9862	.9861	.9861	.9860	.9860	.9859
58	.9859	.9859	.9858	.9858	.9857	.9857	.9856	.9856	.9855	.9855	.9854
59	9.9854	9.9854	9.9853	9.9853	9.9852	9.9852	9.9851	9.9851	9.9850	9.9850	9.9849
	1 <sup>m</sup> .0	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0
<i>With minutes in right hand column.</i> { $11^h$ , cosine -; $23^h$ , cosine +; $5^h$ , sine +; $17^h$ , sine -											

LOGARITHMS OF SINES AND COSINES. <i>With the argument in time.</i>												
<i>1<sup>h</sup>, sine +; 13<sup>h</sup>, sine -; 7<sup>h</sup>, cosine -; 19<sup>h</sup>, cosine +; With minutes in left hand column.</i>												
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1 <sup>m</sup> .0	
0	9.4130	9.4137	9.4144	9.4151	9.4158	9.4165	9.4172	9.4179	9.4186	9.4193	9.4200	59
1	.4200	.4207	.4214	.4221	.4228	.4235	.4242	.4248	.4255	.4262	.4269	58
2	.4269	.4276	.4283	.4289	.4296	.4303	.4310	.4317	.4323	.4330	.4337	57
3	.4337	.4343	.4350	.4357	.4364	.4370	.4377	.4384	.4390	.4397	.4403	56
4	.4403	.4410	.4417	.4423	.4430	.4436	.4443	.4449	.4456	.4462	.4469	55
5	9.4469	9.4475	9.4482	9.4488	9.4495	9.4501	9.4508	9.4514	9.4521	9.4527	9.4533	54
6	.4533	.4540	.4546	.4553	.4559	.4565	.4572	.4578	.4584	.4591	.4597	53
7	.4597	.4603	.4609	.4616	.4622	.4628	.4634	.4641	.4647	.4653	.4659	52
8	.4659	.4666	.4672	.4678	.4684	.4690	.4696	.4703	.4709	.4715	.4721	51
9	.4721	.4727	.4733	.4739	.4745	.4751	.4757	.4763	.4769	.4775	.4781	50
10	9.4781	9.4787	9.4793	9.4799	9.4805	9.4811	9.4817	9.4823	9.4829	9.4835	9.4841	49
11	.4841	.4847	.4853	.4859	.4865	.4871	.4876	.4882	.4888	.4894	.4900	48
12	.4900	.4906	.4911	.4917	.4923	.4929	.4935	.4940	.4946	.4952	.4958	47
13	.4958	.4963	.4969	.4975	.4981	.4986	.4992	.4998	.5003	.5009	.5015	46
14	.5015	.5020	.5026	.5032	.5037	.5043	.5049	.5054	.5060	.5065	.5071	45
15	9.5071	9.5077	9.5082	9.5088	9.5093	9.5099	9.5104	9.5110	9.5115	9.5121	9.5126	44
16	.5126	.5132	.5137	.5143	.5148	.5154	.5159	.5165	.5170	.5176	.5181	43
17	.5181	.5186	.5192	.5197	.5203	.5208	.5213	.5219	.5224	.5230	.5235	42
18	.5235	.5240	.5246	.5251	.5256	.5262	.5267	.5272	.5278	.5283	.5288	41
19	.5288	.5293	.5299	.5304	.5309	.5314	.5320	.5325	.5330	.5335	.5341	40
20	9.5341	9.5346	9.5351	9.5356	9.5361	9.5366	9.5372	9.5377	9.5382	9.5387	9.5392	39
21	.5392	.5397	.5402	.5408	.5413	.5418	.5423	.5428	.5433	.5438	.5443	38
22	.5443	.5448	.5453	.5458	.5463	.5469	.5474	.5479	.5484	.5489	.5494	37
23	.5494	.5499	.5504	.5509	.5514	.5519	.5523	.5528	.5533	.5538	.5543	36
24	.5543	.5548	.5553	.5558	.5563	.5568	.5573	.5578	.5583	.5587	.5592	35
25	9.5592	9.5597	9.5602	9.5607	9.5612	9.5617	9.5621	9.5626	9.5631	9.5636	9.5641	34
26	.5641	.5646	.5650	.5655	.5660	.5665	.5670	.5674	.5679	.5684	.5689	33
27	.5689	.5693	.5698	.5703	.5708	.5712	.5717	.5722	.5726	.5731	.5736	32
28	.5736	.5740	.5745	.5750	.5754	.5759	.5764	.5768	.5773	.5778	.5782	31
29	.5782	.5787	.5792	.5796	.5801	.5805	.5810	.5815	.5819	.5824	.5828	30
30	9.5828	9.5833	9.5838	9.5842	9.5847	9.5851	9.5856	9.5860	9.5865	9.5869	9.5874	29
31	.5874	.5878	.5883	.5887	.5892	.5896	.5901	.5905	.5910	.5914	.5919	28
32	.5919	.5923	.5928	.5932	.5937	.5941	.5945	.5950	.5954	.5959	.5963	27
33	.5963	.5968	.5972	.5976	.5981	.5985	.5990	.5994	.5998	.6003	.6007	26
34	.6007	.6011	.6016	.6020	.6024	.6029	.6033	.6037	.6042	.6046	.6050	25
35	9.6050	9.6055	9.6059	9.6063	9.6068	9.6072	9.6076	9.6080	9.6085	9.6089	9.6093	24
36	.6093	.6097	.6102	.6106	.6110	.6114	.6119	.6123	.6127	.6131	.6135	23
37	.6135	.6140	.6144	.6148	.6152	.6156	.6161	.6165	.6169	.6173	.6177	22
38	.6177	.6181	.6186	.6190	.6194	.6198	.6202	.6206	.6210	.6214	.6219	21
39	.6219	.6223	.6227	.6231	.6235	.6239	.6243	.6247	.6251	.6255	.6259	20
40	9.6259	9.6264	9.6268	9.6272	9.6276	9.6280	9.6284	9.6288	9.6292	9.6296	9.6300	19
41	.6300	.6304	.6308	.6312	.6316	.6320	.6324	.6328	.6332	.6336	.6340	18
42	.6340	.6344	.6348	.6352	.6356	.6360	.6364	.6368	.6371	.6375	.6379	17
43	.6379	.6383	.6387	.6391	.6395	.6399	.6403	.6407	.6411	.6415	.6418	16
44	.6418	.6422	.6426	.6430	.6434	.6438	.6442	.6446	.6449	.6453	.6457	15
45	9.6457	9.6461	9.6465	9.6469	9.6472	9.6476	9.6480	9.6484	9.6488	9.6491	9.6495	14
46	.6495	.6499	.6503	.6507	.6510	.6514	.6518	.6522	.6526	.6529	.6533	13
47	.6533	.6537	.6541	.6544	.6548	.6552	.6556	.6559	.6563	.6567	.6570	12
48	.6570	.6574	.6578	.6582	.6585	.6589	.6593	.6596	.6600	.6604	.6607	11
49	.6607	.6611	.6615	.6618	.6622	.6626	.6629	.6633	.6637	.6640	.6644	10
50	9.6644	9.6648	9.6651	9.6655	9.6659	9.6662	9.6666	9.6669	9.6673	9.6677	9.6680	9
51	.6680	.6684	.6687	.6691	.6695	.6698	.6702	.6705	.6709	.6713	.6716	8
52	.6716	.6720	.6723	.6727	.6730	.6734	.6737	.6741	.6744	.6748	.6752	7
53	.6752	.6755	.6759	.6762	.6766	.6769	.6773	.6776	.6780	.6783	.6787	6
54	.6787	.6790	.6794	.6797	.6801	.6804	.6808	.6811	.6814	.6818	.6821	5
55	9.6821	9.6825	9.6828	9.6832	9.6835	9.6839	9.6842	9.6845	9.6849	9.6852	9.6856	4
56	.6856	.6859	.6863	.6866	.6869	.6873	.6876	.6880	.6883	.6886	.6890	3
57	.6890	.6893	.6896	.6900	.6903	.6907	.6910	.6913	.6917	.6920	.6923	2
58	.6923	.6927	.6930	.6933	.6937	.6940	.6943	.6947	.6950	.6953	.6957	1
59	9.6957	9.6960	9.6963	9.6967	9.6970	9.6973	9.6977	9.6980	9.6983	9.6986	9.6990	0
	1 <sup>m</sup> .0	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0	
<i>With minutes in right hand column. } 10<sup>h</sup>, sine +; 22<sup>h</sup>, sine -; 4<sup>h</sup>, cosine +; 16<sup>h</sup>, cosine -</i>												



LOGARITHMS OF SINES AND COSINES. <i>With the argument in time.</i>												
1 <sup>h</sup> , cosine +; 13 <sup>h</sup> , cosine —; 7 <sup>h</sup> , sine +; 19 <sup>h</sup> , sine — <i>{ With minutes in left hand column.</i>												
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1 <sup>m</sup> .0	
0	9.9849	9.9849	9.9848	9.9848	9.9847	9.9847	9.9846	9.9846	9.9845	9.9845	9.9844	59
1	.9844	.9844	.9843	.9843	.9842	.9842	.9841	.9841	.9840	.9840	.9839	58
2	.9839	.9839	.9838	.9838	.9837	.9836	.9836	.9835	.9835	.9834	.9834	57
3	.9834	.9833	.9833	.9832	.9832	.9831	.9831	.9830	.9830	.9829	.9828	56
4	.9828	.9828	.9827	.9827	.9826	.9826	.9825	.9825	.9824	.9823	.9823	55
5	9.9823	9.9822	9.9822	9.9821	9.9821	9.9820	9.9820	9.9819	9.9818	9.9818	9.9817	54
6	.9817	.9817	.9816	.9816	.9815	.9815	.9814	.9813	.9813	.9812	.9812	53
7	.9812	.9811	.9811	.9810	.9809	.9809	.9808	.9808	.9807	.9807	.9806	52
8	.9806	.9805	.9805	.9804	.9804	.9803	.9802	.9802	.9801	.9801	.9800	51
9	.9800	.9800	.9799	.9798	.9798	.9797	.9797	.9796	.9795	.9795	.9794	50
10	9.9794	9.9794	9.9793	9.9792	9.9792	9.9791	9.9791	9.9790	9.9789	9.9789	9.9788	49
11	.9788	.9788	.9787	.9786	.9786	.9785	.9785	.9784	.9783	.9783	.9782	48
12	.9782	.9781	.9781	.9780	.9780	.9779	.9778	.9778	.9777	.9776	.9776	47
13	.9776	.9775	.9775	.9774	.9773	.9773	.9772	.9771	.9771	.9770	.9770	46
14	.9770	.9769	.9768	.9768	.9767	.9766	.9766	.9765	.9764	.9764	.9763	45
15	9.9763	9.9763	9.9762	9.9761	9.9761	9.9760	9.9759	9.9759	9.9758	9.9757	9.9757	44
16	.9757	.9756	.9755	.9755	.9754	.9753	.9753	.9752	.9751	.9751	.9750	43
17	.9750	.9749	.9749	.9748	.9747	.9747	.9746	.9745	.9744	.9744	.9743	42
18	.9743	.9743	.9742	.9741	.9741	.9740	.9739	.9739	.9738	.9737	.9737	41
19	.9737	.9736	.9735	.9735	.9734	.9733	.9733	.9732	.9731	.9731	.9730	40
20	9.9730	9.9729	9.9728	9.9728	9.9727	9.9726	9.9726	9.9725	9.9724	9.9724	9.9723	39
21	.9723	.9722	.9722	.9721	.9720	.9719	.9719	.9718	.9717	.9717	.9716	38
22	.9716	.9715	.9714	.9714	.9713	.9712	.9712	.9711	.9710	.9709	.9709	37
23	.9709	.9708	.9707	.9707	.9706	.9705	.9704	.9704	.9703	.9702	.9702	36
24	.9702	.9701	.9700	.9699	.9699	.9698	.9697	.9696	.9696	.9695	.9694	35
25	9.9694	9.9693	9.9693	9.9692	9.9691	9.9690	9.9690	9.9689	9.9688	9.9688	9.9687	34
26	.9687	.9686	.9685	.9685	.9684	.9683	.9682	.9682	.9681	.9680	.9679	33
27	.9679	.9679	.9678	.9677	.9676	.9675	.9674	.9674	.9673	.9672	.9672	32
28	.9672	.9671	.9670	.9669	.9669	.9668	.9667	.9666	.9666	.9665	.9664	31
29	.9664	.9663	.9662	.9662	.9661	.9660	.9659	.9659	.9658	.9657	.9656	30
30	9.9656	9.9655	9.9655	9.9654	9.9653	9.9652	9.9651	9.9651	9.9650	9.9649	9.9648	29
31	.9648	.9647	.9647	.9646	.9645	.9644	.9643	.9643	.9642	.9641	.9640	28
32	.9640	.9639	.9639	.9638	.9637	.9636	.9635	.9635	.9634	.9633	.9632	27
33	.9632	.9631	.9631	.9630	.9629	.9628	.9627	.9626	.9626	.9625	.9624	26
34	.9624	.9623	.9622	.9622	.9621	.9620	.9619	.9618	.9617	.9617	.9616	25
35	9.9616	9.9615	9.9614	9.9613	9.9612	9.9612	9.9611	9.9610	9.9609	9.9608	9.9607	24
36	.9607	.9606	.9606	.9605	.9604	.9603	.9602	.9601	.9601	.9600	.9599	23
37	.9599	.9598	.9597	.9596	.9595	.9595	.9594	.9593	.9592	.9591	.9590	22
38	.9590	.9589	.9588	.9588	.9587	.9586	.9585	.9584	.9583	.9582	.9582	21
39	.9582	.9581	.9580	.9579	.9578	.9577	.9576	.9575	.9575	.9574	.9573	20
40	9.9573	9.9572	9.9571	9.9570	9.9569	9.9568	9.9567	9.9567	9.9566	9.9565	9.9564	19
41	.9564	.9563	.9562	.9561	.9560	.9559	.9558	.9558	.9557	.9556	.9555	18
42	.9555	.9554	.9553	.9552	.9551	.9550	.9549	.9549	.9548	.9547	.9546	17
43	.9546	.9545	.9544	.9543	.9542	.9541	.9540	.9539	.9538	.9538	.9537	16
44	.9537	.9536	.9535	.9534	.9533	.9532	.9531	.9530	.9529	.9528	.9527	15
45	9.9527	9.9526	9.9525	9.9525	9.9524	9.9523	9.9522	9.9521	9.9520	9.9519	9.9518	14
46	.9518	.9517	.9516	.9515	.9514	.9513	.9512	.9511	.9510	.9509	.9508	13
47	.9508	.9507	.9506	.9506	.9505	.9504	.9503	.9502	.9501	.9500	.9499	12
48	.9499	.9498	.9497	.9496	.9495	.9494	.9493	.9492	.9491	.9490	.9489	11
49	.9489	.9488	.9487	.9486	.9485	.9484	.9483	.9482	.9481	.9480	.9479	10
50	9.9479	9.9478	9.9477	9.9476	9.9475	9.9474	9.9473	9.9472	9.9471	9.9470	9.9469	9
51	.9469	.9468	.9467	.9466	.9465	.9464	.9463	.9462	.9461	.9460	.9459	8
52	.9459	.9458	.9457	.9456	.9455	.9454	.9453	.9452	.9451	.9450	.9449	7
53	.9449	.9448	.9447	.9446	.9445	.9444	.9443	.9442	.9441	.9440	.9439	6
54	.9439	.9438	.9437	.9436	.9435	.9434	.9433	.9432	.9431	.9430	.9429	5
55	9.9429	9.9428	9.9427	9.9426	9.9424	9.9423	9.9422	9.9421	9.9420	9.9419	9.9418	4
56	.9418	.9417	.9416	.9415	.9414	.9413	.9412	.9411	.9410	.9409	.9408	3
57	.9408	.9407	.9406	.9404	.9403	.9402	.9401	.9400	.9399	.9398	.9397	2
58	.9397	.9396	.9395	.9394	.9393	.9392	.9391	.9389	.9388	.9387	.9386	1
59	9.9385	9.9385	9.9384	9.9383	9.9382	9.9381	9.9380	9.9379	9.9377	9.9376	9.9375	0
	1 <sup>m</sup> .0	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0	
<i>With minutes in right hand column. 10<sup>h</sup>, cosine —; 22<sup>h</sup>, cosine +; 4<sup>h</sup>, sine +; 16<sup>h</sup>, sine —</i>												

LOGARITHMS OF SINES AND COSINES. <i>With the argument in time.</i>												
2 <sup>h</sup> , sine +; 14 <sup>h</sup> , sine —; 8 <sup>h</sup> , cosine —; 20 <sup>h</sup> , cosine + { <i>With minutes in left hand column.</i>												
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1 <sup>m</sup> .0	
0	9.6990	9.6993	9.6996	9.7000	9.7003	9.7006	9.7009	9.7013	9.7016	9.7019	9.7022	59
1	.7022	.7026	.7029	.7032	.7035	.7039	.7042	.7045	.7048	.7051	.7055	58
2	.7055	.7058	.7061	.7064	.7068	.7071	.7074	.7077	.7080	.7084	.7087	57
3	.7087	.7090	.7093	.7096	.7099	.7103	.7106	.7109	.7112	.7115	.7118	56
4	.7118	.7122	.7125	.7128	.7131	.7134	.7137	.7140	.7144	.7147	.7150	55
5	9.7150	9.7153	9.7156	9.7159	9.7162	9.7165	9.7168	9.7172	9.7175	9.7178	9.7181	54
6	.7181	.7184	.7187	.7190	.7193	.7196	.7199	.7202	.7205	.7209	.7212	53
7	.7212	.7215	.7218	.7221	.7224	.7227	.7230	.7233	.7236	.7239	.7242	52
8	.7242	.7245	.7248	.7251	.7254	.7257	.7260	.7263	.7266	.7269	.7272	51
9	.7272	.7275	.7278	.7281	.7284	.7287	.7290	.7293	.7296	.7299	.7302	50
10	9.7302	9.7305	9.7308	9.7311	9.7314	9.7317	9.7320	9.7323	9.7326	9.7329	9.7332	49
11	.7332	.7335	.7338	.7341	.7344	.7346	.7349	.7352	.7355	.7358	.7361	48
12	.7361	.7364	.7367	.7370	.7373	.7376	.7379	.7381	.7384	.7387	.7390	47
13	.7390	.7393	.7396	.7399	.7402	.7405	.7407	.7410	.7413	.7416	.7419	46
14	.7419	.7422	.7425	.7427	.7430	.7433	.7436	.7439	.7442	.7445	.7447	45
15	9.7447	9.7450	9.7453	9.7456	9.7459	9.7462	9.7464	9.7467	9.7470	9.7473	9.7476	44
16	.7476	.7478	.7481	.7484	.7487	.7490	.7492	.7495	.7498	.7501	.7504	43
17	.7504	.7506	.7509	.7512	.7515	.7517	.7520	.7523	.7526	.7529	.7531	42
18	.7531	.7534	.7537	.7540	.7542	.7545	.7548	.7551	.7553	.7556	.7559	41
19	.7559	.7561	.7564	.7567	.7570	.7572	.7575	.7578	.7580	.7583	.7586	40
20	9.7586	9.7589	9.7591	9.7594	9.7597	9.7599	9.7602	9.7605	9.7607	9.7610	9.7613	39
21	.7613	.7616	.7618	.7621	.7624	.7626	.7629	.7632	.7634	.7637	.7640	38
22	.7640	.7642	.7645	.7647	.7650	.7653	.7655	.7658	.7661	.7663	.7666	37
23	.7666	.7669	.7671	.7674	.7676	.7679	.7682	.7684	.7687	.7690	.7692	36
24	.7692	.7695	.7697	.7700	.7703	.7705	.7708	.7710	.7713	.7716	.7718	35
25	9.7718	9.7721	9.7723	9.7726	9.7728	9.7731	9.7734	9.7736	9.7739	9.7741	9.7744	34
26	.7744	.7746	.7749	.7752	.7754	.7757	.7759	.7762	.7764	.7767	.7769	33
27	.7769	.7772	.7774	.7777	.7780	.7782	.7785	.7787	.7790	.7792	.7795	32
28	.7795	.7797	.7800	.7802	.7805	.7807	.7810	.7812	.7815	.7817	.7820	31
29	.7820	.7822	.7825	.7827	.7830	.7832	.7835	.7837	.7840	.7842	.7844	30
30	9.7844	9.7847	9.7849	9.7852	9.7854	9.7857	9.7859	9.7862	9.7864	9.7867	9.7869	29
31	.7869	.7872	.7874	.7876	.7879	.7881	.7884	.7886	.7889	.7891	.7893	28
32	.7893	.7896	.7898	.7901	.7903	.7906	.7908	.7910	.7913	.7915	.7918	27
33	.7918	.7920	.7922	.7925	.7927	.7930	.7932	.7934	.7937	.7939	.7941	26
34	.7941	.7944	.7946	.7949	.7951	.7953	.7956	.7958	.7960	.7963	.7965	25
35	9.7965	9.7968	9.7970	9.7972	9.7975	9.7977	9.7979	9.7982	9.7984	9.7986	9.7989	24
36	.7989	.7991	.7993	.7996	.7998	.8000	.8003	.8005	.8007	.8010	.8012	23
37	.8012	.8014	.8017	.8019	.8021	.8024	.8026	.8028	.8031	.8033	.8035	22
38	.8035	.8037	.8040	.8042	.8044	.8047	.8049	.8051	.8053	.8056	.8058	21
39	.8058	.8060	.8063	.8065	.8067	.8069	.8072	.8074	.8076	.8078	.8081	20
40	9.8081	9.8083	9.8085	9.8087	9.8090	9.8092	9.8094	9.8095	9.8099	9.8101	9.8103	19
41	.8103	.8105	.8108	.8110	.8112	.8114	.8117	.8119	.8121	.8123	.8125	18
42	.8125	.8128	.8130	.8132	.8134	.8137	.8139	.8141	.8143	.8145	.8148	17
43	.8148	.8150	.8152	.8154	.8156	.8159	.8161	.8163	.8165	.8167	.8169	16
44	.8169	.8172	.8174	.8176	.8178	.8180	.8182	.8185	.8187	.8189	.8191	15
45	9.8191	9.8193	9.8195	9.8198	9.8200	9.8202	9.8204	9.8206	9.8208	9.8211	9.8213	14
46	.8213	.8215	.8217	.8219	.8221	.8223	.8225	.8228	.8230	.8232	.8234	13
47	.8234	.8236	.8238	.8240	.8242	.8245	.8247	.8249	.8251	.8253	.8255	12
48	.8255	.8257	.8259	.8261	.8264	.8266	.8268	.8270	.8272	.8274	.8276	11
49	.8276	.8278	.8280	.8282	.8284	.8286	.8289	.8291	.8293	.8295	.8297	10
50	9.8297	9.8299	9.8301	9.8303	9.8305	9.8307	9.8309	9.8311	9.8313	9.8315	9.8317	9
51	.8317	.8319	.8322	.8324	.8326	.8328	.8330	.8332	.8334	.8336	.8338	8
52	.8338	.8340	.8342	.8344	.8346	.8348	.8350	.8352	.8354	.8356	.8358	7
53	.8358	.8360	.8362	.8364	.8366	.8368	.8370	.8372	.8374	.8376	.8378	6
54	.8378	.8380	.8382	.8384	.8386	.8388	.8390	.8392	.8394	.8396	.8398	5
55	9.8398	9.8400	9.8402	9.8404	9.8406	9.8408	9.8410	9.8412	9.8414	9.8416	9.8418	4
56	.8418	.8420	.8422	.8424	.8426	.8428	.8429	.8431	.8433	.8435	.8437	3
57	.8437	.8439	.8441	.8443	.8445	.8447	.8449	.8451	.8453	.8455	.8457	2
58	.8457	.8459	.8460	.8462	.8464	.8466	.8468	.8470	.8472	.8474	.8476	1
59	9.8476	9.8478	9.8480	9.8482	9.8483	9.8485	9.8487	9.8489	9.8491	9.8493	9.8495	0
	1 <sup>m</sup> .0	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0	
<i>With minutes in right hand column.</i> { 9 <sup>h</sup> , sine +; 21 <sup>h</sup> , sine —; 3 <sup>h</sup> , cosine +; 15 <sup>h</sup> , cosine —												

LOGARITHMS OF SINES AND COSINES. <i>With the argument in time.</i>												
$2^h$ , cosine +; $14^h$ , cosine -; $8^h$ , sine +; $20^h$ , sine - { <i>With minutes in left hand column.</i>												
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	1 <sup>m</sup> .0	
0	9.9375	9.9374	9.9373	9.9372	9.9371	9.9370	9.9369	9.9368	9.9367	9.9365	9.9364	59
1	.9364	.9363	.9362	.9361	.9360	.9359	.9358	.9357	.9355	.9354	.9353	58
2	.9353	.9352	.9351	.9350	.9349	.9348	.9346	.9345	.9344	.9343	.9342	57
3	.9342	.9341	.9340	.9339	.9337	.9336	.9335	.9334	.9333	.9332	.9331	56
4	.9331	.9330	.9328	.9327	.9326	.9325	.9324	.9323	.9322	.9320	.9319	55
5	9.9319	9.9318	9.9317	9.9316	9.9315	9.9313	9.9312	9.9311	9.9310	9.9309	9.9308	54
6	.9308	.9306	.9305	.9304	.9303	.9302	.9301	.9300	.9298	.9297	.9296	53
7	.9296	.9295	.9294	.9292	.9291	.9290	.9289	.9288	.9287	.9285	.9284	52
8	.9284	.9283	.9282	.9281	.9279	.9278	.9277	.9276	.9275	.9274	.9272	51
9	.9272	.9271	.9270	.9269	.9268	.9266	.9265	.9264	.9263	.9261	.9260	50
10	9.9260	9.9259	9.9258	9.9257	9.9255	9.9254	9.9253	9.9252	9.9251	9.9249	9.9248	49
11	.9248	.9247	.9246	.9244	.9243	.9242	.9241	.9240	.9238	.9237	.9236	48
12	.9236	.9235	.9233	.9232	.9231	.9230	.9229	.9227	.9226	.9225	.9224	47
13	.9224	.9222	.9221	.9220	.9219	.9217	.9216	.9215	.9214	.9212	.9211	46
14	.9211	.9210	.9209	.9207	.9206	.9205	.9204	.9202	.9201	.9200	.9198	45
15	9.9198	9.9197	9.9196	9.9195	9.9193	9.9192	9.9191	9.9190	9.9188	9.9187	9.9186	44
16	.9186	.9184	.9183	.9182	.9181	.9179	.9178	.9177	.9175	.9174	.9173	43
17	.9173	.9172	.9170	.9169	.9168	.9166	.9165	.9164	.9163	.9161	.9160	42
18	.9160	.9159	.9157	.9156	.9155	.9153	.9152	.9151	.9149	.9148	.9147	41
19	.9147	.9146	.9144	.9143	.9142	.9140	.9139	.9138	.9136	.9135	.9134	40
20	9.9134	9.9132	9.9131	9.9130	9.9128	9.9127	9.9126	9.9124	9.9123	9.9122	9.9120	39
21	.9120	.9119	.9118	.9116	.9115	.9114	.9112	.9111	.9110	.9108	.9107	38
22	.9107	.9106	.9104	.9103	.9101	.9100	.9099	.9097	.9096	.9095	.9093	37
23	.9093	.9092	.9091	.9089	.9088	.9086	.9085	.9084	.9082	.9081	.9080	36
24	.9080	.9078	.9077	.9075	.9074	.9073	.9071	.9070	.9069	.9067	.9066	35
25	9.9066	9.9064	9.9063	9.9062	9.9060	9.9059	9.9057	9.9056	9.9055	9.9053	9.9052	34
26	.9052	.9050	.9049	.9048	.9046	.9045	.9043	.9042	.9041	.9039	.9038	33
27	.9038	.9036	.9035	.9033	.9032	.9031	.9029	.9028	.9026	.9025	.9023	32
28	.9023	.9022	.9021	.9019	.9018	.9016	.9015	.9013	.9012	.9011	.9009	31
29	.9009	.9008	.9006	.9005	.9003	.9002	.9000	.8999	.8998	.8996	.8995	30
30	9.8995	9.8993	9.8992	9.8990	9.8989	9.8987	9.8986	9.8984	9.8983	9.8982	9.8980	29
31	.8980	.8979	.8977	.8976	.8974	.8973	.8971	.8970	.8968	.8967	.8965	28
32	.8965	.8964	.8962	.8961	.8959	.8958	.8956	.8955	.8953	.8952	.8950	27
33	.8950	.8949	.8947	.8946	.8944	.8943	.8941	.8940	.8938	.8937	.8935	26
34	.8935	.8934	.8932	.8931	.8929	.8928	.8926	.8925	.8923	.8922	.8920	25
35	9.8920	9.8919	9.8917	9.8916	9.8914	9.8913	9.8911	9.8910	9.8908	9.8907	9.8905	24
36	.8905	.8903	.8902	.8900	.8899	.8897	.8896	.8894	.8893	.8891	.8890	23
37	.8890	.8888	.8887	.8885	.8883	.8882	.8880	.8879	.8877	.8876	.8874	22
38	.8874	.8872	.8871	.8869	.8868	.8866	.8865	.8863	.8862	.8860	.8858	21
39	.8858	.8857	.8855	.8854	.8852	.8850	.8849	.8847	.8846	.8844	.8843	20
40	9.8843	9.8841	9.8839	9.8838	9.8836	9.8835	9.8833	9.8831	9.8830	9.8828	9.8827	19
41	.8827	.8825	.8823	.8822	.8820	.8819	.8817	.8815	.8814	.8812	.8810	18
42	.8810	.8809	.8807	.8806	.8804	.8802	.8801	.8799	.8797	.8796	.8794	17
43	.8794	.8793	.8791	.8789	.8788	.8786	.8784	.8783	.8781	.8779	.8778	16
44	.8778	.8776	.8775	.8773	.8771	.8770	.8768	.8766	.8765	.8763	.8761	15
45	9.8761	9.8760	9.8758	9.8756	9.8755	9.8753	9.8751	9.8750	9.8748	9.8746	9.8745	14
46	.8745	.8743	.8741	.8740	.8738	.8736	.8734	.8733	.8731	.8729	.8728	13
47	.8728	.8726	.8724	.8723	.8721	.8719	.8718	.8716	.8714	.8712	.8711	12
48	.8711	.8709	.8707	.8706	.8704	.8702	.8700	.8699	.8697	.8695	.8694	11
49	.8694	.8692	.8690	.8688	.8687	.8685	.8683	.8682	.8680	.8678	.8676	10
50	9.8676	9.8675	9.8673	9.8671	9.8669	9.8668	9.8666	9.8664	9.8662	9.8661	9.8659	9
51	.8659	.8657	.8655	.8654	.8652	.8650	.8648	.8647	.8645	.8643	.8641	8
52	.8641	.8640	.8638	.8636	.8634	.8632	.8631	.8629	.8627	.8625	.8624	7
53	.8624	.8622	.8620	.8618	.8616	.8615	.8613	.8611	.8609	.8607	.8606	6
54	.8606	.8604	.8602	.8600	.8598	.8597	.8595	.8593	.8591	.8589	.8588	5
55	9.8588	9.8586	9.8584	9.8582	9.8580	9.8578	9.8577	9.8575	9.8573	9.8571	9.8569	4
56	.8569	.8568	.8566	.8564	.8562	.8560	.8558	.8556	.8555	.8553	.8551	3
57	.8551	.8549	.8547	.8545	.8544	.8542	.8540	.8538	.8536	.8534	.8532	2
58	.8532	.8531	.8529	.8527	.8525	.8523	.8521	.8519	.8517	.8516	.8514	1
59	9.8514	9.8512	9.8510	9.8508	9.8506	9.8504	9.8502	9.8501	9.8499	9.8497	9.8495	0
	1 <sup>m</sup> .0	.9	.8	.7	.6	.5	.4	.3	.2	.1	.0	
<i>With minutes in right hand column.</i> { $9^h$ , cosine -; $21^h$ , cosine +; $3^h$ , sine +; $15^h$ , sine -												

























JUN 13 1940

